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JOURNAL of GERONTOLOGY

NON-TECHNICAL SUPPLEMENT

To add life to years, not just years to life

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THE NON-TECHNICAL SUPPLEMENT
Robert A. Moore

GERONTOLOGY
Lawrence K. Frank

INCREASE IN MORTALITY AS MANIFESTATION OF AGING
Henry S. Simms

AGE OF STEM TISSUE AND CAPACITY TO FORM ROOTS
P. W. Zimmerman and A. E. Hitchcock

AGING IN NUTRITIONALLY DEFICIENT PERSONS
Tom D. Spies and Harvey S. Collins

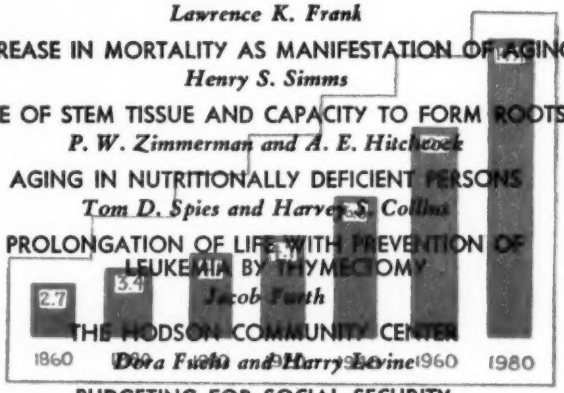
PROLONGATION OF LIFE WITH PREVENTION OF LEUKEMIA BY THYMECTOMY
Jacob Furth

THE HODSON COMMUNITY CENTER
Dora Fuchs and Harry Levine

BUDGETING FOR SOCIAL SECURITY
W. R. Williamson

THE AGED IN PRIMITIVE SOCIETIES
Leo W. Simmons

SHAKESPEARE'S ATTITUDE TOWARD OLD AGE
John W. Draper



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Journal of Gerontology

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The Non-Technical Supplement

ONE OF the most serious and challenging problems for the world of the next half-century will be the changing character of the population. In 1900 the percentage of the population of the United States over 65 years of age was 4.1. By 1940 the figure had risen to 6.8 and by 1980 will reach 14.4. In actual numbers this means that in 1940 there were nine million people over sixty-five and in 1980 there will be twenty-six million. The reason for the increase is two-fold: the normal increment of population in a growing nation approaching the plateau; and the extension of life expectancy. The life expectancy of the white male child at birth in 1901 was 48.23 years. In 1939 it was 62.60 years; an increase of almost 15 years. On the other hand, the expectancy of a white man aged 60 in 1901 was 14.35, while in 1939 it was 14.36; an increase of about 3 days. Much has been accomplished, but more waits to be done.

Simply stated, the American people have been given a gift—a score or more years of life which were not expected. The donors were the scientists, physicians, dentists, nutritionists, and others who have labored hard and long in laboratories and clinics. The essential outlook is bluntly expressed by an anonymous lady of near eighty: "Having made their presentation, they watch us grow older and are alarmed at the Frankenstein act they have put on. They cry, 'What in Heaven's name are we going to do with all these old people? They have to be fed and housed and cared for and the bulk of them are so difficult to get along with'."

Just as there are two reasons for the progressive change in the proportion of older people in our country, there are two interrelated aspects of the problem to be met and solved: the creation of a social and economic order in which the older individual takes a real part; and further extension of a healthy and happy life by prevention, alleviation, or cure of disease.

Clearly, now is the opportune time for all those concerned with the problem to join hands and minds in the solution—the physician, the sociologist, the economist, the psychologist, the social worker, and many others, and last but by no means least, the older person who is the common denominator. The Gerontological Society will hold meetings at which the results of study and research may be freely discussed, the JOURNAL OF GERONTOLOGY will publish the details of the investigations for the scientist, and the Non-Technical Supplement of the JOURNAL will make available to an interested public these same investigations in an understandable language. Thus, there will be united intellectually those who may need help and those who may, if properly supported, supply that help. The day has come when scientists may with profit tell the nonscientists what is being done for them and in their name.

Since the dawn of history, the scientist in general, and the physician in particular, have been accused of concealing knowledge by adoption of a language, referred to by many as "mumbo-jumbo." This attitude fails to recognize a basic proposition—words and language were devised by man for exact expression of ideas and thoughts. These ideas and thoughts vary in complexity and require differing backgrounds for understanding. The papers of the nuclear physicist and atomic bomb expert are as strange to the physician as are the papers of the physician to the furniture salesman. All things are relative. Each profession and trade has a "mumbo-jumbo" peculiar to it and usually unknown to others.

Just because the physician or the nuclear physicist has long unpronounceable words with precise meanings for the effective exchange of ideas, there is no reason why these same ideas may not be conveyed in simpler language with more generally known words. This is possible provided the reader has a background of knowledge to understand the new. There are thus two prerequisites for all reading: a knowledge of the meaning of the words, and an understanding of the accumulated information relating to the subject.

The Non-Technical Supplement of the JOURNAL OF GERONTOLOGY will attempt to bring to the general public the results of research on the problems of aging and the care of the aged. Each article in the JOURNAL OF GERONTOLOGY will be abstracted and rewritten in a style understandable to the average person.

At times it may be necessary to use scientific or medical words for which there is no generally known equivalent. These words are printed in italics; and the pronunciation, derivation, definition, and, if pertinent, history of them are given in a glossary (see page 80 of this issue). In addition, each glossary will carry certain general rules on the formation and meaning of scientific words.

Some papers will be a discussion of current economic or social problems with which most people are conversant. Others will consider more complex subjects which require a background of knowledge. In the latter, an introductory paragraph entitled BACKGROUND will serve to provide the necessary information so that the reported research may be understood (see pages 20 and 27 of this issue).

For the benefit of those oldsters whose visual activity is not what it was, the type of the Supplement is one point larger than that of the technical journal—11 point on 13.

The Non-Technical Supplement is designed for the average American who wishes to keep abreast with opinion and research in an important aspect of modern civilization. Suggestions from readers will be welcomed.

ROBERT A. MOORE
Editor-in-Chief

Gerontology

LAWRENCE K. FRANK

THE PUBLICATION of the JOURNAL OF GERONTOLOGY as the official journal of the newly organized Gerontological Society, Incorporated, is significant of several recent scientific developments and of ongoing changes in our social and cultural life.

For several years we have been hearing more frequently of geriatrics, the new medical specialty for the aged, like pediatrics for infants and children. There have been studies of mental and personality changes in the aged, together with discussions of the rapid trend toward an older population.

Gerontology emerges today as a response to these scientific needs and these social responsibilities. It reflects the recognition of a new kind of problem that will increasingly command the interest and devotion of a variety of scientists, scholars, and professional workers, all of whom are needed to study such problems as human growth, development, aging human conservation, and cultural change.

Since all living organisms exist in space and time and pass through a sequence of changes from their inception to their dissolution, aging is a broad biologic problem. But the kind, rate, and expressions of aging differ among organisms: some plants, protozoa, and insects, for example, do not exhibit the familiar picture of senescence. Thus, no general theory of aging for all organisms can at present be formulated.

In the mammalian species, however, the problem of aging appears in all its baffling complexity. There appears to be an orderly, regular sequence of growth, development, maturation, aging, and senescence, like a broad highway, from conception to death, along which each individual must travel. But it is evident that each one will pass

---

Mr. Lawrence K. Frank, director of the Caroline Zachry Institute for Human Development, New York City, was born in Cincinnati, Ohio, in 1890 and received his A.B. degree from Columbia University in 1912. He served on the War Industry Board in 1918 and 1919, the Laura Spelman Rockefeller Memorial from 1923 to 1929, the Spelman fund in 1930, and as vice-president of the Josiah Macy Jr. Foundation from 1936 to 1942.

along that highway and pass through those changes at his own individual rate of progression and will attain dimensions of size, shape, weight, functional capacities, and behavior adjustments which are uniquely his own. Some, of course, due to accident, disease, and other adverse events or circumstances, will die prematurely at different stages in the life sequence.

Clinical records support the common observation of the extraordinary variations among individuals of the same chronological age. Some individuals of advanced years are still vigorous, showing few or none of the normal signs of enfeeblement or impairment. In contrast, some individuals at early adult life are prematurely aged as compared to their contemporaries.

It is becoming increasingly evident that the interpretation of the frequent tissue changes found in the aged organism as normal products of aging calls for some further reflections. Men and women come to senescence after a life time of varied experiences, having suffered from the usual deficiencies, insufficiencies, and vicissitudes of early care and nurture, having been subjected to infections, injuries, stresses and strains, inadequate or neglected convalescence, plus all the "slings and arrows of outrageous fortune." How many of these changes can be considered as normal aging and how much should they be viewed as evidence of attempted repair or organic adaptation to adverse and threatening events of life?

There are today two conflicting views of aging, especially in man. One conception is that of an involutionary process, which cumulatively produces inevitable changes in structures and functions; in tissues, in cells, and in fluids. The contrasting conception is a going process which is not to be confused with the degenerative breakdowns observed in the aged, but rather should be considered as a process of biologic transformation, the nature and operation of which have scarcely been realized. The confusion between these two theories has been increased by the recognition of how some of these structural and functional changes appear to be conservative or protective adaptations of the organism in its attempt to maintain itself against various threats and deprivations the body meets.

These questions indicate that we are still on the threshold of the problem of aging and must await further investigations to bring some resolution of these seemingly contradictory findings and implica-

tions. There is a pressing need for more experiments upon the problem of aging in order to settle the basic issue of what the aging process involves.

In our population there is a steadily growing number and proportion of older men and women. These older people tend to fear and to resist change at a time when it has become imperative to reduce the discrepancy between the political, economic, and social practices of the nineteenth century. The stresses, strains, and defeats to which we are exposed in our personal, family, and social living are fostering an accelerated aging among younger adults, and are bringing increasingly difficult adjustments for those over fifty.

Recent social security legislation, both federal and state, is at once a recognition of the increased number of aged and their often unfortunate lot after a lifetime of work. It is an earnest of what will probably follow in providing housing, health, medical care, and other facilities for the aged.

The American economy has for generations been oriented to a constantly increasing population, predominantly of young adults with a large number of children. To feed, clothe, house, educate, entertain, and otherwise to care for more and more people every decade gave American business an ever expanding market and supply of labor.

Now our population growth has slowed down and the number of older men and women is increasing. This is bringing a series of readjustments to all organized activities and professions. While there will continue to be a demand for houses, furniture, infants' and children's goods, and the food to feed growing appetites, this demand will decline relative to the more limited needs and specialized requirements of older people who will call for more hospitals and medical services, nursing, suitable housing, and other services.

We have scarcely begun to realize the variety and magnitude of the social, economic, and political readjustments that must soon be made. We have not yet formulated a long-term nationwide policy to guide the decisions and transitions we must make, all rendered increasingly difficult by the postwar reconversion and by the breakdown of so many traditional beliefs. It is evident that the conservatism of the aged will further complicate the task.

Yet we must energetically plan for the days ahead and incorporate

in city planning, housing, postwar public works, and administrative programs more adequate provisions for the growing number of older men and women.

Thus we will need more studies by the social scientists, and by all students of aging in order to help all fields of work gain an understanding of the problems and hazards of the aged.

Because so few can meet the readjustments of advancing years after fifty with wisdom and courage, there will be a growing need of counsellors for the aged. In part, this need will be met by ministers, priests, rabbis, by social workers, and by physicians, especially those trained in geriatrics. However, the old age counsellor may become necessary to bring more specialized knowledge and skills of all these established professions into a coherent way of life for individual men and women.

There will be need for more clinic and hospital facilities for care of the aged, to provide teaching material, especially for postgraduate training of the more experienced physicians who can bring to geriatric medicine the cumulative experience needed for wise and understanding treatment of the aged. Specialists in geriatrics must be constantly informed of new discoveries and methods if they are to advance their speciality and meet the needs of the older patient, especially emotional and personality difficulties.

Statistically there are millions of men and women growing older, all more or less baffled by the changes within themselves and the confusion and turmoil in the world around them. Yet each one is a distinct, unique organism-personality with his or her idiosyncrasies of functioning and living, with his or her idiomatic way of acting and feeling, as each one living in his or her private world views the outside in terms of memories and expectations, of hopes and fears. For each one, therefore, even the most generalized and common services and provisions must be rendered for an individual.

This, then, is the test of our many organizations, institutions, professions, and services which the pressure of standardization is driving toward a large, impersonal rigidity that may become more terrifying than the ills, hazards, and insecurities against which they are organized to defend us.

We need a national policy for the aged in order to provide clearly enunciated goals and values by which to guide this ever growing set

of organizations as they affect the aged. We need a national policy to guide our social, political, and especially our economic activities toward more conservative operations to replace the present, almost brutal, neglect of the aged, so many of whom have been ruthlessly misused and prematurely aged by our current practices.

There is a widespread feeling of defeatism about old age as if the last years of life, the period of later maturity, were inevitably a barren, tragic time of decline and frustration. So much of the wisdom of the aged has become less valuable because of the rapid march of events and of social and cultural changes. The long sought goal of old age is being realized by ever increasing numbers who are scarcely prepared to use these added years for personal fulfilment or social living.

For all these problems we must have more research, more explorations in preventive medicine or health care to reduce the heavy toll of years and illness, and more guidance for the aged. Besides this, we must make better use of the increasing amount of knowledge available.

What we do or fail to do with human resources will provide a crucial test of our democratic faith and of our ability to maintain a free social order in the face of mounting insecurity and disorder in the postwar world. For this we need more knowledge of human growth, development, maturation, and aging to guide our programs and practices.

The JOURNAL OF GERONTOLOGY, as the first journal in this field, will provide a medium of communication and of interpretation. As Thomas Hobber pointed out, not the people of long ago when the world was younger, but we of today are the aged, the ancients of days.

QUIZ ON THE SOCIAL SECURITY LAW

What is the maximum average monthly salary that may be counted toward the computation of benefits under old-age and survivors' insurance?

$150 $200 $250 $350

Answer on page 26

Logarithmic Increase in Mortality as a Manifestation of Aging

HENRY S. SIMMS

BACKGROUND

GOMPERTZ, more than a century ago, first called attention to a definite relation between mortality rate and age. Certainly it is evident today by merely looking at the mortality figures that we have increased the length of life and decreased the mortality rate through the control of disease. For one week in 1945 the death rate was numbered as 8.9 per thousand population with a rate of 10.2 per thousand for the first 40 weeks of the year. Looking at the rates over a period of years, we see a rate of 12.77 per thousand in 1870 compared with 10.8 in 1940. In 70 years we have dropped the rate 1.97 and have increased the length of the life span. With further control of disease the rate will be dropped even more.

There are several kinds of curves; two of which are the "logarithmic" and the "linear."

Linear curves are drawn with even spacing of the units on both of the axes of the graph. If the mortality rate is plotted as a linear function against age, a curve is obtained which is nearly horizontal up to the age of 50, bends from 50 to 70, and is nearly vertical after the age of 70. In short, the per cent mortality, or the "probability of death" is small until the age of 50 after which it increases sharply

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Dr. Henry S. Simms is associate professor of biochemistry at the College of Physicians and Surgeons, Columbia University, New York. He received his B.S. degree from Massachusetts Institute of Technology in 1920 and his Ph.D. from Columbia University in 1922. He formerly was on the staff of the Rockefeller Institute in New York from 1920 to 1926 and taught biochemistry at the California Institute of Technology in 1931 and 1932. His work has been with lipoids, weak electrolytes, milk secretion, tissue cultures, the process of aging, and wound healing.

This investigation is a part of the Program for Research on Aging at the College of Physicians and Surgeons, aided by grants from the Josiah Macy, Jr. Foundation, W. R. Warner and Company, and the Wendell L. Willkie Memorial grant of the Albert and Mary Lasker Foundation.

(Fig. 1). Logarithmic mortality graphs plot the logarithm of the probability of death against age. For example, in figure 2, -1 is a

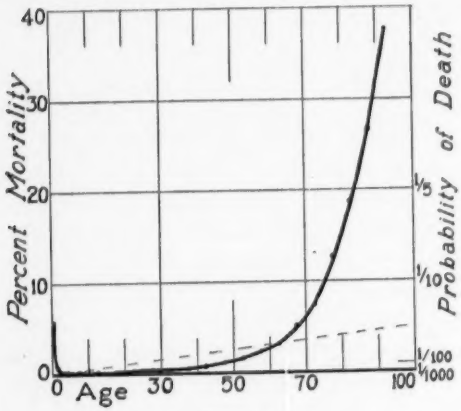

FIGURE 1

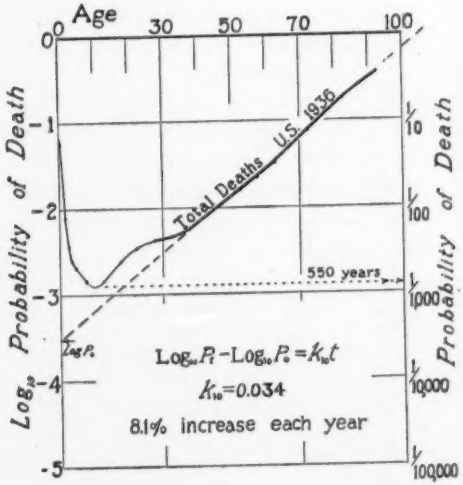

FIGURE 2

probability of one death among ten living people, and -2 is a probability of one death in one hundred living people. Thus, the even

spacing from 0 to −5 does not represent equal probability as it does in a linear graph. For most diseases these show an essentially straight line after the age of 30. (Fig. 2.)

Dr. Simm's Investigation

Most diseases may be classified into three groups: (1) the infectious diseases, which have a gradual increase in mortality—5 per cent each year with increasing age. These diseases are characterized by a high infant mortality which falls to a minimum at the age of ten, after which there is a slow increase. Such diseases as lobar pneu-

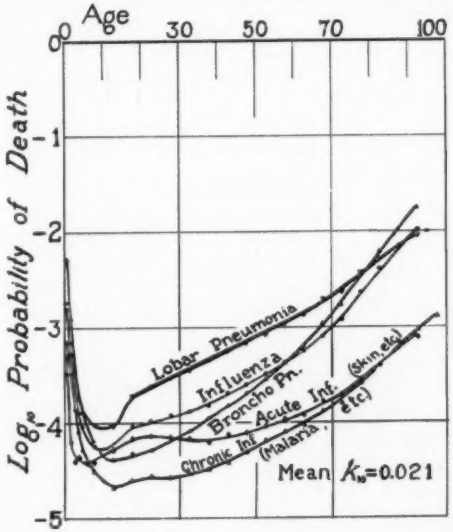

Figure 3

monia, influenza, bronchopneumonia, and malaria all have similar curves which fall into this pattern (Fig. 3). (2) Diseases involving organ or tissue failure. The mortality from these diseases rises at a faster rate, 7 per cent each year, than from the infectious diseases. This group includes such diseases as ulcers, pellagra, diarrhea, asthma, pernicious anemia, and stomach disorders. It can be noted that these diseases are for the most part the result of failure of a given tissue or organ, and they have surprising similarity to each other

insofar as the slopes of their curves are concerned (Fig. 4). (3) Diseases of the cardiovascular-renal s[illegible]em. During youth these have a low mortality but the mortality [illegible]es so rapidly with increasing age, 11 per cent each year, that they become the predominant causes of death in later life. These diseases, including cerebral hemorrhage,

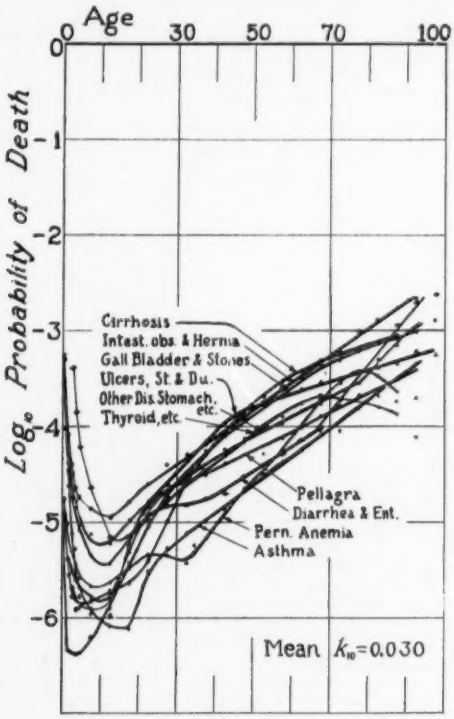

FIGURE 4

chronic *nephritis*, chronic *myocarditis*, *angina pectoris*, *cerebral embolism*, arthritis, rheumatism, and arteriosclerosis, are the ones which are most fatal to older people. These cardiovascular-renal diseases are not restricted to the aged, but occur throughout the whole life span. Their incidence in early life is low but they increase so rapidly

Words in italics are defined in the Glossary, page 80.

with increasing age that they become the predominant causes of death in later life. These diseases are often referred to as the "degenerative diseases" but might more properly be called "adult diseases" (Fig. 5). Interestingly enough, the curve for unemployment, as a measure of loss of ability, essentially parallels the cardiovascular-

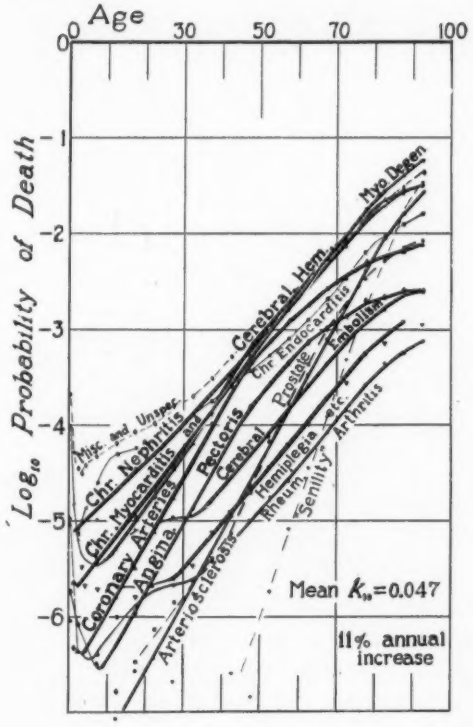

FIGURE 5

renal diseases. The logarithmic curve is essentially straight after the age of 45.

Between the ages of 10 and 70 the curves for cancer resemble those for the cardiovascular-renal diseases. Contrary to some beliefs, cancer deaths are at all ages considerably fewer than deaths from cardiovascular-renal diseases. The cancer curves increase until the age of

70 then have a tendency to flatten out and become horizontal if extended far enough (Fig. 6).

Deaths from appendicitis and from tonsillitis show but a gradual increase with age. Perhaps this may be attributed to the fact that the higher age groups contain a large number of individuals who

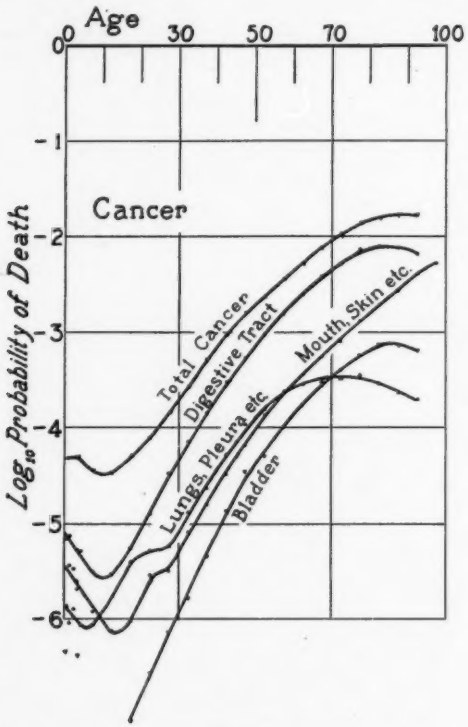

FIGURE 6

have had their appendices and tonsils removed. Epilepsy also has a horizontal curve while tuberculosis forms almost a horizontal line after the age of 25. In short, there is little increase in the number of deaths from these diseases with increasing age. Obviously, maternal deaths reach their peak around the age of 30 then drop until they become negligible. Chronic alcoholism reaches its peak around 50 years of age then declines.

It may be computed that if the mortality rate could be maintained constant at the level of the age of 10, man would have a life expectancy of 800 years and some individuals would survive 22,000 years (Table 1). There is at this time no proof for or against the possibility that we can some day extend our active life an extra one

TABLE I

	P_0	k	Per Cent Annual Increase in Mortality
Rat	0.058	0.51	224
Human	0.0028	0.034	8.2
Ratio: $\frac{\text{Rat}}{\text{Human}}$	$\frac{21}{1}$	$\frac{15}{1}$	$\frac{27}{1}$

hundred or two hundred years with retention of youthful health, intelligence, and appearance. Further research is needed, not only on the causes and nature of degenerative diseases, but also on the reasons for their increasing fatality with advancing years. We can extend longevity only if we can either (1) reduce the incidence of these diseases (level of the curves) or (2) reduce their rate of increase (steepness of the curves). If we cannot control these factors, then we cannot extend longevity.

APPENDIX

For those readers who have a bent for mathematics, the formula of the relation of mortality and age used by Dr. Simms is:

$$\log_e \frac{P_t}{P_0} = k_e t$$

when P_t is the probability of death at age t, P_0 is the extrapolated probability of death at birth, and k_e is constant. It should be borne in mind that this equation is merely an empirical equation which was derived to agree with the data. Its simplicity does not imply that the process of aging which it represents is a simple one.

The calculation of a potential life span of 550 years is based on the

following derivations of this basic formula. If the mortality rate were to remain constant throughout the life span, then P_t would have a constant value (P) and k would be equal to zero. In order to compute the life span under such conditions we may write:

$$P = -\frac{dN}{N}\,dt.$$

when N is the number of living individuals, and $-dN$ is the number of individuals dying in the time interval dt. Integrating this we obtain the following equation:

$$t = \frac{2.3}{P}\log_{10}\frac{N_0}{N_t}.$$

From this equation we may obtain potential life expectancy (the age to which one half the young individuals may be expected to survive) by taking $N_0/N_t = 2$: that is, of two people born, one is still alive.

$$t = \frac{2.3 \times 0.301}{P} = \frac{0.693}{P}.$$

Human beings at the age of ten have a death rate of only one in 1160. Using this value for P we find that the life expectancy would be about 800 years.

A SOFT OR A HARD *G*

In general the *g* before *a*, *o*, or *u* is pronounced as a hard *g;* before a short *i* (*y*) or *e* as *j;* and before a long *i* (*y*) or *e* either as hard *g* or *j* depending on the word. However there are many exceptions to these three general rules.

Usage and the rule coincide with the word "gerontology," and hence it is:

je-ron-tol′-o-je

The Relation Between Age of Stem Tissue and the Capacity to Form Roots

P. W. Zimmerman and A. E. Hitchcock

Background

When the stem of almost any kind of plant is cut and put in a moist place, it begins to form new cells similar to the healing of a wound in an animal.

Greenwood cuttings are from young tissues with leaves. Leafless cuttings in the fall or winter are hardwood cuttings.

Dr. Zimmerman and Dr. Hitchcock's Investigation

Although there is considerable variation among closely related species and varieties of plants, it is clearly evident that there is a relation between the age of a plant and its natural capacity to form adventitious roots. This age factor in older plants can generally be overcome with the aid of hormone-like substances which serve as chemical growth regulators, and which have the power to induce adventitious roots on tissues where roots do not naturally appear.

The ability of a cutting from a species to form roots when placed in the ground can readily be illustrated with the lilac. Stem cuttings of young shoots of lilac taken in May have the capacity to grow ad-

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Dr. P. W. Zimmerman received his B.S. degree in 1915, his M.S. in 1916 and his Ph.D. in 1925 from the University of Chicago. He served as assistant botanist at Chicago and as professor and acting dean of the College of Agriculture at the University of Maryland from 1918 to 1925. Since then he has been plant physiologist at the Boyce Thompson Institute for Plant Research in Yonkers, New York.

A graduate of the University of Maryland and of Columbia University where he received his Ph.D. in 1928, Dr. A. E. Hitchcock has been plant physiologist at Boyce Thompson Institute since 1925. He was field assistant during the summer from 1922 to 1925, for the United States Department of Agriculture. He has worked principally on vegetative propagation, effect of gases on plants. plant hormones and growth substances, and growth regulation.

ventitious roots, especially if they are treated with a *hormone*-like root-inducing substance. The capacity to form roots gradually declines with the passing of spring and is completely gone by July. After that time the plant tissue can no longer form roots even with the help of artificially applied root-inducing substances.

Apple cuttings rarely form roots without the aid of root-inducing substances. Stem cuttings of young shoots of many varieties of apples taken in early May form roots when treated with growth substances. Sometime during May the tissue reaches its maximum capacity to regenerate roots and from then on decreases until June.

Some species of plants root most readily from old tissue while

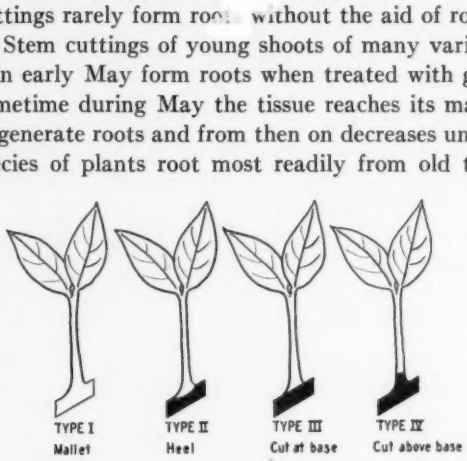

FIGURE 1. Four types of cuttings.

others root best from young tissue. American Pillar Rose canes grow rapidly, and somewhere within a few inches back of the growing tip, the stem tissue has the capacity to regenerate roots when made into cuttings. Younger tissue does not root and neither does older tissue. Closely related species, however, differ widely from this, older tissue rooting with great ease.

The relation of the capacity to root to the age of the plant tissue at the base of greenwood cuttings was investigated, and it was found that the response of rooting varied with the type of cutting. Four types of cuttings were recognized: mallet cuttings of previous season's wood, heel cuttings including a small amount of the previous season's wood, cuttings with the base made of current season's growth, and cuttings with the base from one-quarter to three-quarters of an inch above the current season's growth. Rooting varied with the type of

Words in italics are defined in the Glossary, page 80.

cutting. The mallet type was generally poor and the third type was usually good. In short, the chances for rooting increased with a decrease in the cutting of old wood.

Cuttings from seedlings of difficultly propagated species have the capacity to form roots, whereas cuttings from old trees of the same species can seldom be induced to root. Most species of pine, chestnut, and oak afford good illustrations of the latter type. Even though hormone-like substances are applied to the cuttings, the tissue no longer has the capacity to make use of them.

The mechanism in plants through which chemicals act is not understood, and it is further complicated by the fact that closely related species or varieties differ widely in their response. The new use of plant hormones has thrown some light on the subject, but it is reasonably certain that the change in structure or protoplasm with age is a major controlling factor.

Professor Edwards Christian died in 1823 in the full vigor of his incapacity.

HENRY GUNNING in "Reminiscences of the University, Town, and County of Cambridge"

The menopause is the frontier of the territory of old age.

SIR HUMPHREY ROLLESTON

Older people have a passionate, absorbing, almost blood-thirsty clinging to life.

MATTHEW ARNOLD

Observations on Aging in Nutritionally Deficient Persons

Tom D. Spies and Harvey S. Collins

Economic Background

In the southern United States it has become more and more apparent each year that there is an important relation between nutrition and economics which is a part of the poverty-stricken condition of so many southerners. Among share croppers and tenant farmers a poor diet is the direct result of the agricultural policy, because they live on what they can grow with greatest ease: corn, pork and sorghum. Within the great range of Southern states may be found two contrasting pictures. One portrays the excellence of southern cooking. The other is the diet of the masses, commonly described as a major factor in deficiencies of vitality and health.

The average income of the South is low. According to the report to the President by the National Emergency Council, published in July, 1938, the average income in the South in 1937 was $314, while in the rest of the country it was $604, nearly twice as much. Farm

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Dr. Tom. D. Spies, associate professor of internal medicine at the University of Cincinnati, has been director of the Nutrition Clinic, Hillman Hospitale, Birmingham, Alabama, since 1936. A graduate of Harvard Medical School, class of 1927, Dr. Spies has been on the staff of the Peter Bent Brigham Hospital and of Western Reserve University.

Dr. Harvey S. Collins, a graduate of Harvard Medical School in 1943, has been working in the Nutrition Clinic on a Nutrition Foundation Fellowship. In February, 1946, he went to Europe to help in the rehabilitation program there.

This paper is one of the University of Cincinnati Studies in Nutrition at the Hillman Hospital.

The tremendously heavy expenses of the general nutrition study have been borne by grants from a number of philanthropic persons, foundations, and commercial concerns, without which this study could not have been made. The necessary expense of frequent observations of these persons in their homes and in the clinic over a long period of time has been defrayed by grants from the Martha Leland Sherwin Memorial Fund and the Ciba Pharmaceutical Products, Inc.

people received an average gross income of $186, out of which operating expenses had to be paid, leaving a very small amount for food and clothing. Surveys showed that the average tenant family received only $73 per person a year. Earnings of share croppers ranged from $38 to $87 per person. In share cropping and tenant farming, there is little time or energy to produce for home consumption. The problem is further complicated because there are fewer productive adult workers and more dependents.

So, the result is a pellagra-ridden, undernourished population about which something must be done. (Winters, J. C., Relation of Human Nutrition to the Social and Economic Condition of the South, J. Am. Dietet. A. 16: 215–221, 1940.)

Medical Background

Vitamin B was one of the first dietary essentials to be recognized. It was originally prepared from rice polishings and used in the cure of *beriberi*. However, it soon became evident that, unlike other vitamins, Vitamin B was not a single substance but a combination of several different ones. Of the factors which have been isolated in comparatively pure form, at least three are essential in human nutrition: *thiamin*, *riboflavin*, and *niacin*. Thiamin is Vitamin B_1, and riboflavin is Vitamin B_2 or G. Because of conflict and overlapping in lettering, the essential components of Vitamin B are today designated by chemical names. Other components of Vitamin B, less well known, are pyridoxin, pantothenic acid, choline, and the grass factor.

Severe thiamin deficiency in the human body leads to a condition known as beriberi, a disease common in China, Japan, and Brazil. Symptoms include a sense of heaviness and weariness in the limbs, aching and burning. There is a gradual loss of muscle strength and loss of appetite. In the United States a deficiency of thiamin causes a *polyneuritis*, characterized by pain along many different nerves.

Riboflavin was first identified in milk. Deficiency causes sores to appear in the mouth and on the tongue, and in some cases, brings on dimness of vision.

Niacin deficiency in the human body brings on a condition known as pellagra, which is characterized by signs pertaining especially to

Words in italics are defined in the Glossary, page 80.

the skin, the gastro-intestinal tract, and the central nervous system. Eruptions resembling sunburn appear on the back of the hands and on other exposed areas of the body, such as the forehead, neck, and feet. This is accompanied by diarrhea, excessive salivary secretion, vomiting, and nausea. The tongue becomes red and swollen and may ulcerate. Symptoms pertaining to the nervous system are headache, dizziness, depression, and impairment of memory.

A diet of fruit, vegetables, eggs, milk, meats, and fish contain an adequate supply of thiamin, riboflavin, and niacin to furnish the body with needed amounts. Brewers' yeast is the best source of riboflavin, although it is generously present in apricots, tomatoes, milk, eggs, and liver.

Dr. Spies' and Dr. Collins' Investigation

During the last ten years it has been observed at the Nutrition Clinic at Birmingham, Alabama, that nutritive failure is common among women of child-bearing age. Frequently these women have inadequate diets during pregnancy and lactation. As a result, the quality of their breast milk is poor, and the supply often is not enough for the child's needs. The children are usually underweight, underdeveloped, and appear to be undernourished and in poor health. They are irritable, easily frightened, and cry a great deal. They often say that they are too tired to play; yet they cannot rest. Many of them complain of vague symptoms such as soreness of the lips, burning and pain in the stomach, and cramping and aching of the feet and legs. As a rule they are listless and frequently appear and act like little old men and women.

Yet in the Nutrition Clinic it is not among children that nutritive failure is most common (see figure 1). It is among women during the child-bearing period. These women, without exception, appear older than their actual ages. Nutritive failure among men of the same age is less common. However, as men and women reach the age when loss of teeth is common, the number who develop nutritional deficiencies is about the same in both sexes. As an example there is Mrs. H. W., a 70 year old white woman, who was brought to the Nutrition Clinic in a *semicomatose* condition. She was the

Words in italics are defined in the Glossary, page 80.

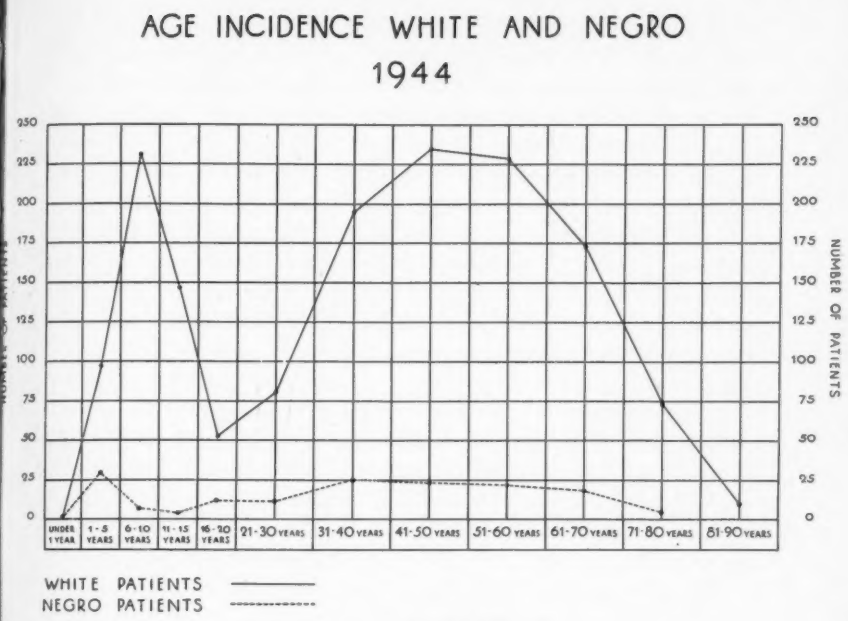

FIG. 1. Age incidence of pellagra.

mother of eight children, all living and well. Until her present illness, she had always been in good health. Although a wide variety of food had been available, she preferred bread, desserts, and sweets to other foods and therefore ate little meat, vegetables, fruit, or milk.

Her present illness began about the time of the menopause, when she was fifty years of age. At this time her son and daughter-in-law with whom she lived noticed that she began to behave in a peculiar way. She seemed afraid of people and often ran to the barn and hid from them. She refused to eat at the table with the family; but when no one was around, she ate in the kitchen and, as far as her family knew, ate only bread, crackers, jam, cake, or pie. She helped a little with the housework and the work in the garden, but she began to stay in bed most of the day and to prowl around the house at night. A physician told the family that if she became worse she should be

put in an institution for the insane but that she might gradually become better. He said that the "breaking out" of her arms was pellagra and advised that she be given raw eggs, milk, and dry brewers' yeast daily. Because she refused to use dentures after she had had her teeth extracted, she could not chew solid food, and so ate only raw eggs, milk, cooked cereal, and occasionally fruit juice.

At times she had *hallucinations*. She said that a sister who had died in childhood was calling her. She packed to go and visit this sister but never left the house. Four weeks before she came to the Clinic she began having diarrhea. She complained that her mouth was sore and refused all food except milk. A week before she came to the Clinic she refused to bathe because of the pain in her legs.

Physical examination showed a tall, thin white woman weighing 92 pounds. Her normal weight in middle life had been 150 to 160 pounds. She was given tablets each containing 5 milligrams thiamin, 2.5 mg. riboflavin, and 75 mg. niacin for three weeks. Her family was told to give her semi-solid foods high in protein, calories, minerals, and vitamins. She was allowed to return home, and her son reported her condition daily. The day following her discharge, her diarrhea stopped and she rested more than she had for months. She ate most of the food offered, no longer complained that her mouth was sore, and her son said her mind was "clearing up " By the end of the week she said that her legs were much less painful. She began helping with the housework, has had no return of symptoms, and is now active and happy. During the war years she managed the household while her son and daughter-in-law worked in war industries.

Another example is Mrs. E. R., a thirty year old white woman who came to the clinic complaining of "breaking out" on her ankles, legs, and forearms, and a sore mouth and tongue.

Her present illness began when she was 27 years old, two months following the birth of her fourth child. Her health and appetitite had always been good but she had never liked milk or lean meat. Four months before this child was born, her husband lost his job because of the depression and could get only occasional work. They could afford to buy only cornmeal, flour, dried beans, and salt pork. After the baby was born, she was weak and tired all the time, but she nursed this child as she had the other three. Her mouth was sore and she became very nervous. She could not sleep because she "saw

things" and thought someone was trying to break into the house. After two months her hands and ankles "broke out." A physician prescribed cod liver oil and advised her to drink milk, and eat eggs, meat, and green vegetables. She did not drink milk but did eat the other foods. Gradually her health improved but during the following spring her symptoms returned in an even more severe form. During the sixth month of her fifth pregnancy, she became very nervous and threatened suicide.

A physical examination at the clinic showed a tall, *emaciated* woman weighing only 110 pounds in her sixth month of pregnancy. Despite the fact that she was only 30 years old, ten physicians judged her age to be between 45 and 50 years. Her skin was dry and wrinkled.

She was given 500 mg. of niacin daily in divided doses, and was told to eat four eggs, four ounces of lean meat, a quart of milk, and green vegetables and fruit. The day after treatment was begun, her mouth and tongue were so much better that she could eat all of the food prescribed. She gained weight and was eating and sleeping well. The "breaking out" on her wrists and ankles disappeared and she had a normal delivery of a normal child.

The family moved away and the patient was not seen again until 1940. She had her teeth taken out but her dentures hurt her mouth so that she ate only soft foods. Examination showed a return of all her previous symptoms. She was again given a diet high in calories, protein, minerals, and vitamins and 500 mg. of niacin.

In 1945 she returned again. After her sixth child had been born she lost all desire for food, lost weight, and her tongue and mouth became sore. Her eyes burned and itched. She became very nervous and was unable to sleep at night because of burning and cramping of her feet and because she heard noises.

The diagnosis this time was pellagra, beriberi, riboflavin deficiency, severe *macrocytic anemia* with *achylia gastrica*, hypoproteinemia, and *ascorbic acid* deficiency. Again she was told to eat food high in protein, calories, vitamins, and minerals. In addition she was given 500 mg. of ascorbic acid and 500 mg. of niacinamide in divided doses daily for ten days, 10 mg. of thiamin and 10 mg. of riboflavin twice a day for ten days, and 20 *U.S.P. units* of *reticulogen*

Words in italics are defined in the Glossary, page 80.

intramuscularly. She improved rapidly. Within a month she had gained 10 pounds, and her strength and vigor had improved so that she got a position as a clerk in a department store. New dentures gave her a different appearance. Her face no longer sagged and she appeared younger to her family and friends.

This premature aging among nutritionally deficient persons is so conspicuous that many observers at the Clinic have commented on it. Of the people in the southern area of the United States, most have had to work extremely hard for many hours every day in the fields, in steel mills, or in mines. Most of the women have been pregnant during most of their child-bearing years. Besides caring for their homes and children, they often work in the fields or outside their homes. After they lose their teeth, many of them either do not get dentures or do not wear them. This makes them look older than their years and also contributes to their inadequate diets because they cannot chew solid foods.

However, hard working men and women with large families living in more bountiful sections of the country do not in such a marked degree look older than their years. Since malnutrition is common in most of the patients and premature aging occurs in many of them, the effect of nutrition on the aging process is a fertile field for investigation.

These cases show that nutritive failure may accompany old age and be considered by the physician as a part of growing old. No one knows what role nutritive failure plays in the aging process. From these two cases it seems that even greater effort should be made to find nutritive failure among older people and to apply the right nutritive therapy. Case 2 illustrates that persons may be judged to be much older than they actually are. Following nutritive treatment, the woman appeared much younger than she had before.

There is no yardstick for measuring nutritive failure, but until there are more scientific methods of measuring the aging process, we may assume nutritive failure may cause a person to appear much older than he or she is.

Answer to quiz on page 8: $250.

Prolongation of Life with Prevention of Leukemia by Thymectomy in Mice

JACOB FURTH

BACKGROUND

THE HUMAN blood contains two kinds of cells: red cells and white cells, so named because they are actually red and white. There are about five million red cells and about seven thousand white ones per cubic millimeter of blood. White cells may be further classified into three important types: myeloid, most of which are better known as "polys" and which come from the bone marrow; lymphocytes, which come from the lymph nodes; and monocytes, the "scavengers" of the body. The red cells carry oxygen while the white ones act in the defense of the body against bacteria.

When the human body manufactures excessive numbers of abnormal white cells, these extra white cells leave the bone marrow or lymph nodes and go into the blood. Thus people may have 100 thousand to 150 thousand white cells per cubic millimeter in their blood, or "white blood," which is *leukemia*.[1]

Just as there are three important kinds of white cells, there are three important kinds of leukemia: myeloid, lymphoid, and monocytic. The causes of leukemia are still unknown although it has been noticed that people exposed to x-rays for a period of time are more

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Professor of pathology, Cornell University Medical College, and associate pathologist, New York Hospital, Dr. Jacob Furth received his M.D. in 1921 from the German University, Prague. Dr. Furth came to America in 1924 and held positions at the Rockefeller Institute and the Henry Phipps Institute in Philadelphia before going to Cornell in 1932.

This investigation has been supported by the International Cancer Research Foundation, the Jane Coffin Childs Memorial Fund for Medical Research, the Anna Fuller Fund, and the Lady Tata Memorial Trust

Miss M. C. Boon and Miss K. Cobbs rendered skillful technical assistance in the course of these experiments.

[1] Words set in italics are defined in the Glossary, page 80.

apt to get it. Anything which injures the bone marrow may produce leukemia. Symptoms include tiredness, paleness, enlarged lymph nodes, and an anemic condition.

Animals also get leukemia. One factor in the cause of leukemia in animals is heredity. By proper breeding, it is possible to get a strain of mice in which most have leukemia. Dr. Jacob Furth for several years has been breeding what is known as the Ak strain of mice in which 70 to 80 per cent die of lymphoid leukemia if they live to be nine months old.

The thymus is one kind of "sweetbread" organ located below the collar bone and underneath the breast plate. It is large at birth, increases slowly in size until puberty, then decreases rather rapidly and is small throughout the rest of life. The thymus is made up in large part of the same kinds of cells as are the lymph nodes. The function of the thymus is not well understood, but it has something to do with growth and with fertility. It has been known for many years that people with certain diseases of the muscles are likely to have a large thymus or a tumor of the thymus.

Dr. Furth's Investigation

For his experiment Dr. Furth used 476 Ak mice. On 219, or about one-half of these, an equal number of males and females, he performed a *thymectomy*, or removal of the thymus. This was done by placing the animal, under deep ether *anesthesia*, on its back with its head toward the operator. An incision was made from the jaw down the neck to the level of the sixth rib. The tissues and muscles were separated down to the breast bone, which was split down to the third rib. This exposed the thymus which lies behind the breast bone, and which can be removed by careful blunt dissection. Special care was taken because the thymus lies over the great blood vessels leading from the heart.

The other mice, 257 in number, used as a control group, were kept in the laboratory until natural death. Both groups, experimental and control were given exactly the same food and water and subjected to the same living and temperature conditions. Autopsies were performed on all the mice.

Words in italics are defined in the Glossary, page 80.

Removal of the thymus at the age of six weeks increased the mean length of life in female mice from 9.5 to 13.6 months and in male mice from 9.7 to 14.4 months. At the same time leukemia had decreased from 83.5 per cent to 10.8 per cent in female mice, and from 78.2 per cent to 9.0 per cent in male mice. (See table 1.) This evidence suggests that the prolongation of life was brought about by prevention of death from leukemia.

TABLE 1. EFFECT OF THYMECTOMY ON INCIDENCE OF LEUKEMIA AND LIFE SPAN OF MICE.

	Thymectomized		Control	
	Females	Males	Females	Males
Number in Group	102	117	112	145
Intercurrent death below six months of age*	1	10	5	14
% developing leukemia	10.8%	9.0%	83.5%	78.2%
Mean age of life in months	13.6	14.4	9.5	9.7

* In calculating leukemia incidence these were discounted from the total.

The results of the study are best interpreted by assuming that the thymus in the mice of the high leukemia strain studied contains potentially *malignant* leukemic cells and by removal of the thymus the animals are spared from leukemia. Thus the life of the animal is greatly prolonged. If the interpretation given is correct, thymectomy will not prevent leukemia in mice in which the disease does not originate in the thymus. The absence of the thymus seems to interfere in no way with the health of the animals.

Additional support that leukemia comes from the thymus is given by experiments with *methylcholanthrene*. Of normal mice painted with it, 35 per cent got leukemia, while of the thymectomized mice painted, only 13 per cent developed leukemia.

Almost all leukemias occurring in the control mice were from the lymph nodes and developed at 7–11 months of age, while most of the leukemias occurring in the thymectomized mice were atypical, myeloid, or monocytic and occurred at a later age. In short, the mice do not die of lymphoid leukemia at an early age and so are more susceptible to other forms of leukemia and to tumors which ordinarily do not occur until later life. This experiment shows how life is pro-

longed because the mice do not get leukemia, but they then become susceptible to other diseases which occur at a later age. One of these is a tumor of bone which was observed in 31 of 51 thymectomized mice and in only 13 of 126 normal mice.

Interpretation

The results of these experiments are comparable to the changing incidence of disease in man during the past fifty years. As the death rate from contagious disease in childhood has decreased, people have lived longer and have died of cancer and high blood pressure. In Dr. Furth's experiments, lymphoid leukemia is the disease of adulthood causing death in 70 to 80 per cent of the Ak mice under normal conditions. Thymectomy prevents leukemia in most mice and hence they live longer and develop other diseases such as atypical leukemia and tumors of bone, usually seen only at an advanced age.

QUIZ ON THE SOCIAL SECURITY LAW

Which of the following types of employment are covered by the present law on old-age and survivors' insurance?

1. Self employment
2. Office work
3. Factory work
4. Casual labor
5. Domestic service
6. Building construction
7. Student nurse
8. Work in cafeterias
9. Work in commercial fisheries
10. Work in banks
11. Newsboy under 18 years of age

Answers on page 34.

The Hodson Community Center: An Experiment in Preservation of Personality

DORA FUCHS AND HARRY LEVINE

SOCIETY'S relation with the older person seems to be geared toward his final disintegration and inevitable institutionalization, despite the fact that facilities to accommodate him are completely inadequate. The sum total of old age homes in New York City, both public and private, has room with crowding for only 12,000 people. The chaotic result has been that many who need institutional care today cannot secure it; and on the other hand, many who can function effectively outside of the institution take up much needed space there.

Fantastic as it may seem, when the Hodson Community Center for old people was started in September, 1943, it was the only example of its kind in a city where there were more than 500,000 people over the age of sixty-five.

At the time when the New York City Welfare Department organized the Hodson Center, there was a recognition that the solution in caring for old people was not in the direction of more old age homes. It was hoped that with adequate preventive care, medical and psychological, the need for hospitals and institutions could be reduced.

Dora Fuchs has been with the New York City Welfare Department for over ten years—in the positions of intake interviewer, supervisory aide, and social investigator. At present she is a field worker in the Bronx Office with a case load consisting mainly of people over sixty-five years of age. Miss Fuchs worked previously as a teacher for the New York City Board of Education, leader of a creative writing group in a settlement house, and a free lance fiction writer. She holds a B.A. degree from Hunter College and an M.A. from Columbia University.

Harry Levine, founder of the Hodson Community Center, has been with the New York City Welfare Department for fourteen years. At present he is welfare administrator of the Manhattan Office. A graduate of Union University and New York Law School, Mr. Levine has been in social work for the past twenty-three years.

The period of dependency might be shortened, thus making possible continued usefulness, dignity, and self respect of the unwanted, complaining, ill at ease, and continuously larger group of older persons in the community.

It was with this understanding that the Hodson Community Center, named in honor of the late William Hodson, Welfare Department Commissioner, was begun in an unused public building in the East Bronx. The local Welfare Department staff voluntarily painted walls, washed woodwork, and arranged furniture in its spare time. Most of the furnishings were contributed by the staff. The Federal Art Project lent pictures. The Welfare Department contributed a piano, some sofas, and some chairs.

Three hundred and fifty people jammed the Center on Opening Day, listened when it was explained that this was their club for their enjoyment, planning, and participation, asked if they could come again. They have been meeting ever since. One hundred and fifty people attend regularly—men and women of varying racial backgrounds, almost another experiment, one in living democracy. The Center is open to all older people in the community. The common denominator is age and the companionship people give each other.

The Center was introduced as a social club where the older person could come and talk, play cards, read newspapers, or listen to the radio, and have tea, coffee, and cake every day. It has become what even the staff did not presume to expect in so short a time.

The staff of the Center takes for granted artistic oils and water colors and charcoal sketches on the walls. They are the natural, visual expression of those 65 to 88 year olds who are interested in developing a medium or talent they had never explored. A teacher was supplied when an interest in art was expressed. But of greater significance, the Center has given warm companionship, a recognition of their individuality as persons, and an understanding of their need for activity that will provide a feeling of adequacy and accomplishment of usefulness and belonging.

The forms of expression at the Hodson Center are as varied as the pattern of living. The important contribution is in freeing the personality so that it can express itself in its own way. What has been achieved is a healthy striving toward fulfilment.

A four-piece musical ensemble plays authentic chamber music.

It emerged out of a new security and appreciation the Center was giving these music lovers who had discarded their love as unwanted.

Members write and mimeograph a magazine once a month, conduct bi-weekly poetry reading sessions, participate in an English and citizenship course, refurbish toys for hospitals and nurseries, prepare afghans and baby clothes for the American Red Cross, and make socks and recreational puzzles for the Maritime Service and utility bags for a veterans' hospital. They build household furniture in a carpentry class, speak their mind at lectures about current problems, and hold discussions on the psychological and physical difficulties of older people.

The people who come have a lessening of physical energy, a separation, physical or emotional, from family and friends, and a loss of occupation. The Center has substituted activity for fears and obsessions about aches and pains.

In its own day to day experiences, the Welfare Department staff had discovered that most older people did not have close relatives with whom they could live. Where there were children, the kind of compatability which makes living together possible was not often found. Differences in religious or cultural observances sometimes interferred, or perhaps it was the older person's resistance to the new in his children's way of living. Or more simply, there was often no room for him either in the small city apartment or in the compact life of younger family relationships. For the most part, the older person, widowed or unmarried, was living alone in a furnished room. He had outlived some of his friends. Others had moved away. Traveling and making new friends was not easy.

More fundamental in the plan was the knowledge that the older person had a lifetime of experience, understanding, and skills to offer. If these assets that only years can give were channelized into programs that were meaningful and important to the older person, the positive and creative in personality would be nourished. And by so doing, the community around the older person would be a richer and more vital one.

Interest and friendship have been substituted for the crotchety complaints, the quarrels with landladies, the recurring dissatisfactions with hospitals, public assistance services, and the world in general. The older person is still prone to seek sympathy. Trained group

leaders are ready to give individual counseling. As the person becomes more assured, more involved in activities, however, the number of his problems tends to decrease and his capacity to cope with them securely improves.

The psychologically well-oriented person is able to go out and meet the community on its own terms. Industry has discovered that recently. The Hudson Motor Company has advertised for workers up to the age of ninety-eight. More than 50,000 people past the age of sixty-five have given up Social Security benefits and gone back to work since Pearl Harbor. The older person has worked efficiently in war agencies, settlement houses, hospitals, and parks. He has trimmed hedges, packed bandages, talked to the blind, and read to the lonely.

Millions are spent yearly in health and public assistance programs for the older person. He remains an unproductive disgruntled being, a continuing drain on the facilities of our clinics, hospitals, and institutions. How much wisely we would be spending if we worked toward developing the strengths of the older person, enabling him to participate as an emotionally healthy, creative member of his community. If a man could learn that productive life can continue on a broader, far more inclusive scale than existed within the previous job definitions, organizations like the Hodson Community Center would become centers of expression, enriching the happiness and cultures of communities.

ANSWERS TO QUIZ ON PAGE 30

1. No
2. Yes
3. Yes
4. No
5. No
6. Yes
7. No
8. Yes
9. Yes
10. Yes
11. No

Your knowledge of the law is excellent (10 or 11 correct), good (7 to 9 correct), average (4 to 6 correct), or poor (3 or less correct).

Budgeting for Social Security

W. R. Williamson

From Queen Elizabeth's time onward, the Anglo-Saxon world has intended that no one should starve, be naked, or shelterless. After 300 years, what at first seemed the humanitarianism of relief given by the charitable on the basis of need, has grown steadily more unacceptable to the average citizens. "Freedom from Want" in the poorhouse, on the charity rolls, or in a penal institution, has meant food, raiment, and shelter. It has also carried a bitter stigma. Such charity emphasized the fact that these people had failed in their personal budgeting. They required rescue by the community after the harm had been done.

Today's emphasis in social security programs is upon the elimination of needs tests. Benefits are to be given as a right, available in the case of both actual and presumptive need. When we merely substitute the less searching needs test for a more searching one, and when we find those persons actually in need and administer to their needs, we carry into the new program the stigma accompanying the old. We do more. We appeal to the cupidity of the individual. We break down the sense of personal pride and personal responsibility. We create difficult choices for citizens between maintaining a rugged self-reliance on limited funds, or accepting the bread of charity. When the man receiving assistance has as much or more than many an individual persisting in his "freedom from charity" we tend to discourage the exercise of prudent foresight and responsibility.

The way to escape from this dilemma is to provide benefits for all based upon presumptive rather than actual need; to add currently

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Mr. William R. Williamson has been actuarial consultant to the Social Security Board since 1936. He received his A.B. degree from Wesleyan University, Middletown, Connecticut, in 1909 and his A.M. in 1910. He was formerly on the actuarial staff of the Travelers Insurance Company and actuarial consultant for the Committee on Economic Security. In 1937 he went to Paris as a delegate of the United States Government to the Eleventh International Congress of Actuaries.

The views expressed by Mr. Williamson are not necessarily the official views of the Social Security Board.

to the large number who are beneficiaries because their need is actual, a larger group of persons who do not essentially need the benefit in the sense that without it they would starve.

Social budgeting may seem an expensive luxury. Dissatisfied with the results of the petty economy which isolated the failures and the unfortunates, it counts upon the cooperation of all citizens to assume freely a preliminary doubling or tripling in the volume of income payments to provide security for all. It provides an over-all floor or protection through budgeting, replacing the use of wide variance in the amounts of benefit, which necessarily follows detailed casework with individual investigation into exact personal requirements. Social budgeting substitutes the less accurate evaluation of presumptive need for the more accurate evaluation of actual need. It may then require a supplementation by public assistance in cases of exceptional need.

The treatment of three personal catastrophic needs, jobless old age, disability of long standing, and dependency of family survivors after the death of the breadwinner, is the area where the pooling services of social insurance seems most valuable. A retired man of 70 may live a decade. A middle-aged person, blinded in an explosion, failing to adapt himself to his new handicap, may live for three decades. The orphan child of 2 or 3 years may live a dozen years before our society allows him to go to work. These are situations where individual budgeting is well guided into pooled, or cooperative provision. We have, in dealing with these situations, many existing facilities outside of governmental programs. There are deferred annuities for the provision of an income in old age, "permanent total disability" insurance to be available in event of long-continued disability, and life insurance in many varieties. There are group insurance and other employer plans. The common denominator of these insurances and annuities is cooperation, responsibility in purpose, and administration. They reinforce social budgeting.

Included within social security handling are two presumptive needs: temporary joblessness and temporary disability. The average duration of the absence from work in either is reckoned in weeks or months, rather than in years; and most citizens, in the absence of social security, have been accustomed to the accumulation of certain personal reserves designed to tide them over such emergencies. Dis-

ability insurance furnishes many special services. There are arrangements for the payment of compensation for the loss of time; provisions to indemnify the individual for the expense of hospitalization, surgical expenditures, and the costs of nursing and dentistry. Combining the loss of income and the extra expense, budgeting is appealing here, also.

Budgeting for social security is a realistic, accounting-minded, responsible tool for society to use. It is an attempt to force a choice between certain benefits, and by certain allocation of our funds to see that those choices become actually effective. It attempts to count the cost, and to secure promptly the benefit of a budgeting process. When Government assumes the responsibility of guiding its citizens into a self-respecting social security program, Government must budget for that program. It must acquire full familiarity with the financial relations entailed.

In the United States, where the pioneering spirit still remains, there is a vitality in engineering direction and a vigor in management policy, which joins social security with other security measures. These together can be tabulated as: (1) Social Security arrangements for floors of protection, financed by the working citizens of the nation; (2) Employer and Mutual Benefit Association plans for group handling of life insurance, disability insurance, and group annuity contracts; and (3) the natural personal provision of individual thrift and voluntary insurance not tied in with employment by a common employer, but providing a range and scope of action to its citizens, dominated by a strong sense of personal responsibility, and evidencing a real effectiveness in handling personal problems.

In 1945 there were ten million individuals sixty-five or older within the continental limits of the United States. By the end of the century we expect to have twice that number. Information as to the rates of pay among many of these older persons at work is slight. Information as to the permanence of their employment is also largely missing. We are dealing with a situation following the successive catastrophes of a major depression, a critical recession, and a devastating war. Perhaps the number of potential aged beneficiaries may lie between six million and seven million persons per year.

A recommendation as to the level of benefits in old age is to adopt the payment of $25 per month per person, or $300 per year. This

would give $50 a month for an aged couple both sixty-five or over. This $300 is not offered as a subsistence level of support, but rather as a floor of protection which seems to be a little high in Southern states and in Northern rural locations. For six or seven million aged beneficiaries the annual budget would be respectively $1,800 million or $2,100 million. This against a national taxable wage bill of perhaps $100 billion would run about 2 per cent.

The $300 yearly benefit represents 15 per cent of what has recently been the average per capita earnings of about $2,000. On a somewhat traditional assumption of 1½ dependents—a little high now—the $2,000 earned income would represent an $800 per capita income.

Looking forward toward the end of the century, with double the number of persons aged sixty-five and over, there can be either an increase in the proportion lacking work, a maintenance of the proportion lacking work, or a decrease in the proportion lacking work. Likewise, over the years, the income from wages is apt to climb so that benefit levels may be advanced in accordance therewith. It is possible that in spite of the larger base against which to measure the benefits, the impact of meeting the cost may rise to as much as 3 per cent or 4 per cent by the end of the century.

It is the old-age portion of these social security measures which has particular significance in our psychological attitude toward the aging process. Men must, after retirement, have significant employments of some sort. A social security program emphasizing the granting of benefits in the absence of any paying job has a quite different viewpoint from pension benefits paid a man as a deferred wage available at the time of the loss of a particular job. If we reach a capacity for wiser use of our manpower at advanced age and if we maintain the limitation that only the jobless receive benefits, we may find a further credit in costs. If the more awkward viewpoint sometimes voiced by organized labor that the competition for jobs must be reduced by eliminating the older man from the labor market, and if technological unemployment grows, costs could be even higher than 4 per cent.

Changes in population, changes in community attitudes, changes in technology, changes in migration are all component elements in the trends of future outlay under social budgeting. The same factors

are also present in any social security program for the aged, including those starting with very small benefit payments. The outlay for the old-age and survivors insurance program bids fair to go to 20 or 30 times today's expenditures, while under social budgeting it might go only to twice today's expenditures.

Canada is considering a slight variation from this social budgeting method in determining age pensions of $30 a month for all aged seventy or over, with benefits on the basis of a needs test as assistance for those aged 65 to 69. The majority of men and women aged seventy and over are through work so that the addition of those who have not terminated work might increase the beneficiary list by 15 to 25 per cent. By adopting this simplification, we would avoid the psychological problem sometimes presented when we seem to deny citizens the right to work by shutting off their benefits when they go back to work. By setting the age at 70 instead of 65 there is a more rational relation between the presumptive working life and the presumptive period of retirement. I should much prefer old-age benefits tied in with the age of 70, because this seems to me a more constructive approach to the potential age at which most people have outgrown their working usefulness.

Summarizing the three programs, jobless old age, long-duration disability, and orphaned childhood and widowed motherhood, we may be dealing with an impact of cost today of from 4 per cent to 7 per cent, with a budget by the end of the century of from 7 per cent to 10 per cent. This is a much sounder balance than to establish benefit programs today of such small over-all magnitude that we anticipate the benefits for the next generation to be twenty to thirty times as large. Today under the combination of assistance and insurance programs, the major group of beneficiaries receives grants as relief or charity. We have created a competition in the amounts of such benefits so that there is a demand for liberalization in both relief and insurance, and the aggregate cost is already much larger than the insurance benefits alone.

Budgeting for social security does not require high-pressure methods for racing a new scale of benefits through a Congressional Special Committee and Congress. It does require the sort of balanced study which preceded the Beveridge Report in Great Britain, with an opportunity for all important elements of the population to be

heard. Age is an extremely important factor for both the benefits to the aged and the benefits to the orphan children.

Budgeting for social security is an over-all arrangement for a floor of protection only. It is designed neither to furnish a comfortable living, nor to meet every situation, even for a minimum required by individual need. Instead it will be buttressed by group methods of planned operation, such as group insurance and retirement plans, and by all the individual forms of thrift. It will also be reinforced for cases of particularly high living costs or particularly serious needs by assistance, relief, or organized charity. It should, however, make unnecessary any relief supplementation for the large majority of beneficiaries and should serve to stimulate the group and individual programs which have been so prominent in the development of America.

DO YOU KNOW?

A claimant for benefits under Old-Age and Survivors' Insurance, if dissatisfied with the ruling of the Bureau, may appeal for:

1. Reconsideration by the Bureau of Old-Age and Survivors' Insurance (not later than six months after original decision);
2. Hearing before a referee (not later than six months after original decision);
3. Review by an Appeals Council in Washington (not later than thirty days after mailing of referee's decision);
4. Civil suit in the Federal Courts (not later than sixty days after mailing of decision of the Appeals Council).

Attitudes Toward Aging and the Aged: Primitive Societies

LEO W. SIMMONS

OLD PEOPLE have always been a problem in every human society, but the nature of the problem and the methods of solving it have changed in different societies and at different times. In spite of everything that has been learned about old age in human history and experience, the problem has become increasingly acute as civilization has advanced. Indeed, in spite of all the marvelous achievements of our modern times, it can be questioned whether the place of the old in society has not been more satisfactory in many respects under simple and more primitive conditions. The charge can certainly be made that civilization has created as well as solved problems of old age. There is still much uncertainty and confusion concerning the proper and expedient place of old people in our society. Perhaps we are more confused and perplexed over the matter than have been our more primitive predecessors and contemporaries. Thus there is need to learn more about their attitudes toward aging and the solutions which they worked out.

When expressed in simplest terms, the social problem of old age in human society is contained in two leading questions: What does it mean to anyone to grow old? And what can be done about it either by the aging person himself or by the society in which he lives? Needless to say, there is no short and satisfactory answer to either question. Even if some primitive peoples, without the benefit of civiliza-

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tion, have had more direct and positive answers than we now have, that does not imply that their solutions would fit our times. There is encouragement, however, in the fact that more or less satisfactory solutions under more primitive conditions may help us who have the immense facilities of modern civilization.

The common underlying factors in the problem, the basic interests of the aged, can be summed up as fivefold:

1. To live as long as possible, until the advantages of death seem to outweigh the burdens of life.
2. To get more rest and opportunities to safeguard and preserve the waning energies of physical existence.
3. To remain active participants in personal and group affairs.
4. To safeguard and strengthen any prerogatives acquired in a long life.
5. Finally, to withdraw from life as honorably as possible without too much suffering and with maximal prospects for an attractive hereafter.

These seem to be about what old people want in primitive societies—and perhaps elsewhere—and they may be summed up in the word security. Basically, we may anticipate that security and survival in senescence are not a boon of nature, nor a gift of the gods. It depends on the contributions which old people can make or the rights which they can command in the particular groups of which they are a part.

In the domestic relations of primitive societies, it seems apparent that the reliance of old people on younger members of kith and kin is a human adjustment so nearly universal that it cuts across most cultural traits and trends and is not greatly hindered by any combination of them. The situation is described in a Chukchi family in Siberia: "The first wife sits with the husband in the warm sleeping room while the second works outside in the cold. Sometimes an aged husband takes a second young wife for the express purpose of giving a helper and maid to his wife who is getting old and cannot get through the housework by herself." As the old people suffer an increasing loss of both physical and mental powers, with no hope of ever regaining them, they differ significantly from the young, the sick, and the temporarily disabled. They are thus forced permanently to withdraw from the rigors of life and to retreat within the bosom

of the family. Here they take their last stand and rely more and more upon their kinsmen to keep body and soul together. But such a retreat to domestic shelter does not imply a mere passive and parasitic existence thereafter. They still have their skills, knowledge, and experience, their magical and religious qualifications, and their property rights and other prerogatives which they may continue to use to the best of their ability; and it would seem that few expedients are left untried by old people in their attempts to find further securities within the confines of the family.

To live is perhaps the first and last care of life. Thus food in proper amounts is a matter of increasing importance to the aged as they become more dependent. In the most rudimentary human societies of which we have reports there are at least some customs of food sharing with the aged. A number of tribes have special food-sharing privileges which favor the old in particular. A rather common means of courting disaster, it is believed, comes in indiscriminate eating. Thus long lists of tender morsels are strictly forbidden to children, to young and middle-aged men, and to child-bearing women; but they are regarded as safe for the old people because of their immunity, built up through a long life. Such taboos with consequent penalties from a single tribe in Australia will illustrate the practice:

Wild turkey and its eggs: premature aging
Parrot and Cockatoos: development of a hollow on the top of the head and a hole in the chin.
Quail and its eggs: general stoppage of growth and no beard.
Eagle-hawk, except the legs: premature aging and leanness.
Wild-cat: painful and foul smelling eruptions on the hand and neck which applies until very old age is reached.

An important means of security for old people, when they become too feeble to forage for themselves, is active association with others and assistance in their interests and enterprises. The aged may engage in secondary economic functions and make themselves as useful as possible in field, camp, shop, and household. They may concentrate on the lighter tasks, and wherever possible, utilize their long experience and greater knowledge in the more complicated skills, rituals, and ceremonies of daily life. Although such opportunities may differ for men and women, under different environmental and cultural conditions, they are basic adjustments in security for both in old age.

In regard to the government and authority of the aged, it may be said that political, judicial, and civil preferment provides a major field for effective social participation of aged people, particularly those who have already obtained positions of prominence and responsibility in the prime of their lives. The title, and often the office, of chieftainship tends to be life-long. Councilmen and elders often fill their functions into very late old age. Old men, moreover, may serve long and well as law-makers, judges, and administrators of justice. Finally as leaders in secret societies and initiatory rites, the aged quite generally receive deference, for they are the ones who control the *rites de passage* from immaturity and insubordination to adulthood, status, and responsibility.

Such positions of influence and power in primitive societies are largely dependent upon three factors: individual ability and initiative, sex, and a favorable combination of social and cultural conditions. In relatively rare instances does age alone qualify one for civil positions of responsibility, and in most instances a state of senescence is eventually reached when the encumbent of an office ceases active participation and retains little more than symbolic powers. Old men are overwhelmingly favored over old women in important political and civil offices in most societies, although aged women often perform prominent functions in initiatory rites. Finally, with advancing economy, greater complexity and integration of social organization, and with general improvement in societal stability, the aged tend to enjoy a steadily rising enhancement of status in civil and political affairs.

In primitive societies aged men and women are generally regarded as repositories of knowledge and imparters of valuable information, as specialists in dealing with the uncertain aleatory element, and as mediators between their fellows and the fearful supernatural powers. These qualifications operate to give them key positions in a wide range of social activities. They are esteemed as experts in solving the problems of life. They supervise and instruct in the arts and crafts and initiate hazardous and important undertakings, such as house-building, boat construction, planting, and warfare. They are in constant demand for treating diseases, working charms, controlling the weather, conjuring enemies, and predicting the future. They are the accredited officiators in the great events of life such as childbirth,

child naming, initiations, weddings, funerals, and "laying of ghosts." They also function frequently as leaders of social gatherings, and as directors of games, songs, dances, and festivals. In fact, hardly any of the great and critical occasions of life are not presided over and supervised by some aged men or women. Truly in primitive societies they are the guardians of life's emergencies, the custodians of its knowledge, and the directors of its ceremonies and pastimes. In possession of such great influence, they are the chief conservators of the status quo. And finally, after death, they are believed to become supernatural agents themselves, still expert in the tried and tested wisdom of the aged, and very jealous of any young upstart who may presume to challenge or change the ancient folk ways.

Among primitive peoples death in old age presents neither simple nor uniform problems, nor has the role of the aged been entirely passive. Both the circumstances of and the attitude toward death are extremely variable. In fact, the social significance of dying for the aged ranges all the way from the height of homage to the depth of degradation. Under varying circumstances, and often entirely beyond personal control, an old person who faces death may be neglected, abandoned, cast out, or even killed by his closest of kin; or, instead, he may be protected by them and carried along gently to the very end of life. In these last moments he may be feared or loved, despised or honored, reviled or even worshipped. And he in turn may deny death as a natural necessity, resist it as a curse, submit to it as the hand of fate, embrace it as a golden opportunity, or even demand it as a right. His dying treatment and the way he takes it is conditioned in part by his personal qualities, but even more by the impersonal, environmental, and cultural factors of his particular social milieu. As the records show, a certain cultural context can make it possible for an old person, by confronting death directly, to achieve thereby something of a victory. But a great deal depends on the social situation and the opportunities afforded by it. To die on some occasions is like undertaking a great adventure in state; but on other occasions the approach of death can be no more than a pathetic and perhaps ignominious struggle all the way. Thus in death, as in life, man's fate is decided by the mores of his time and place.

Some of the contrasts between primitive and civilized societies are quite obvious. One is almost immediately struck with the fact that

primitive peoples generally have far less knowledge concerning the biologic and medical aspects of aging and thus indulge their fancy much more freely concerning the nature and significance of senescence. Thus they have entertained many mythical accounts of a golden age of perpetual youth, of the unnatural occurrence of old age and death, of exceptional persons able to escape both of these misfortunes, and of perennial endeavors to find lost or secret remedies for the rejuvenation and longevity of mankind in general.

Another contrast is the fact that the average length of life in primitive society is short, that most people die off young, and that relatively few ever reach old age as compared with the rapidly increasing proportion of old people among us. Old age, which is something of a rarity with them, becomes a commonplace with us. Thus a modest old age may provide a mark of distinction in primitive society, while with us one may approach a century before receiving much recognition for length of life. If the primitive man does reach senescence, distinction for survival alone may come to him earlier, last as long, and be much more impressive. It is not surprising that old age among us tends to become regarded as a "not to be envied" state of decrepitude, dependency, and helplessness. Think how much more this would be the case should we learn how to keep our old people alive just twice as long as we do now! There would be vastly more old people and much feebler ones at that, in competition for a satisfactory place in society.

The proportion of old people who remain active, productive, and essential in primitive societies is much higher than in advanced civilizations. The primitive peoples have succeeded to an amazing degree in providing cultural conditions which utilize opportunities for an old man or woman to be regarded as a treasured asset in his society. The average old person can be "shelved" as relatively useless earlier, more abruptly, and far more emphatically in our modern civilization than in many primitive societies. In contrast to us, they do not have a calendar bugaboo, an idea that a certain birthday marks a crucial period in one's life, for their usefulness extends far into senescence. Not do they have the qualms and misgiving about death which we find in modern societies.

In conclusion, perhaps this general shift in adaptive processes from primitive society to modern civilization has meant serious losses to

old people. It certainly tends to make the adjustments much more remote and unrealistic today. Moreover, the price of a secure old age must be paid out of the prime of life. Then in old age the beneficiaries become more or less functionless, hangers-on, who have had their day in the field and now are relegated to the side lines. Like unwanted children, it becomes easy for them to feel out of time and out of place. No matter how justly deserving one may be on a past record, a safe seat on the bleacher is a poor substitute for a fighting place in the field. Perhaps it is this passive aspect of old age among us that makes the difference. While modern civilization has added more years to life, it tends to leave less life in the years.

AGEING OR AGING?

The major determining factor in a decision of whether or not to retain the terminal *e* of "age" in the present participle or other derivatives is the pronunciation of the root word. The *e* after the *g* influences pronunciation of the *g* as a *j*. If an ending or suffix beginning with a short *e* or *i* is added, the pronunciation of the *g* is uninfluenced, and the *e* is superfluous and may well be dropped. The only objection to deletion of the *e* is that the root word is reduced to two letters, an objection which is not valid. In the JOURNAL OF GERONTOLOGY the word will be spelled "aging" (see A Manual of Style, University of Chicago Press, p. 73).

Shakespeare's Attitude Toward Old Age

JOHN W. DRAPER

DRAMA, especially in the tumultuous days of Queen Elizabeth, generally concerned the young, handsome, active person appropriate to the role of soldier, courtier, or prince. Bad sanitation and neglected personal hygiene shortened life expectancy until a man was usually expected to retire from court at the age of thirty-five in order to hide his bodily decay. In such an age, when there were no police, and a man's good right arm was his only protection against insult, there was certain contempt for physical infirmities. When an Elizabethan soldier showed signs of age, his occupation was gone and he had no recourse save beggery and starvation. Such were the customs in the days when Shakespeare lived and wrote.

Shakespeare's earliest depiction of old age shows merely its physical aspect. From the Classics came two opposed traditions of old age: from Lucian's *De Luctu*, a tradition that stressed the infirmities and defects; and from Cicero's *De Senectute*, the happier and more pleas-

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He held a fellowship of the Guggenheim Foundation for research in English. His numerous papers and books concern mainly eighteenth century English culture and Shakespeare's writings.

ing aspects. The Elizabethans were naturally predisposed toward the former because of the swift advent of physical decay, and Shakespeare gives much more emphasis to these qualities in his earlier plays. In *A Comedy of Errors* he describes Ægeon in the most obvious details of old age: a broken voice, white hair, pale, cold flesh, weakness of hearing and eyesight, and one mental trait, the loss of memory. Even down to his last years Shakespeare was concerned with the physical infirmities of old age: Cassandra in the *Troilus* refers to "wrinkled eld"; and, in *The Tempest*, age is associated with "cramps," and the old witch Sycorax "with age and envy was grown into a hoop."

Shakespeare presents the psychological aspects of old age increasingly in his later years, and to him these are its most pleasing side. He associates age with such characteristics as experience, eloquence, and discretion. However, not until the middle of his career does he give a full and sympathetic picture of the aged including its maturity and sweetness of character along with the struggle to overcome physical infirmities. This he shows in the person of Adam in *As You Like It* whom he draws as a man with unselfish loyalty, wisdom, and reverence. Adam warns his young master Orlando against Oliver's plots, offers his lord the savings of his lifetime, and asks only to serve him in his exile:

> Here is the gold;
> All this I give you. Let me be your servant;
> Though I look old, yet I am strong and lusty;
> For in my youth I never did apply
> Hot and rebellious liquors in my blood,
> Nor did not with unbashful forehead woo
> The means of weakness and debility;
> Therefore my age is as a lusty winter,
> Frosty but kindly: Let me go with you;
> I'll do the service of a younger man
> In all your business and necessities.

Another example is Gonzalo in *The Tempest* who is unquestionably old and at times perhaps too talkative, but he has terse wisdom and political foresight which are to be respected. In several plays Shakespeare idealizes the feudal classes, the nobles and their servingmen and seems to regret the transition to modern capitalistic society. Economic pressure was making life arduous both for nobles like

Orlando and for servingmen like Adam, and both were perforce abandoning the chivalric ideals and the liberality and the hospitality that had characterized them in Mediaeval times. Great age was certainly unusual among the Elizabethans; and, when it occurred, its weaknesses were much in evidence. Shakespeare, when presenting it in a pleasing guise, deals either with pastoral unreality as in the case of Adam, or with a long-past heroic period of history as in the case of Nestor, or in pure romance as with Gonzalo in *The Tempest*.

The greatest portrait of old age to be found in all world literature was written by a man who was barely forty years old himself: Shakespeare in his picture of King Lear. In Lear he shows the subtle evolution and the psychological processes involved in old age. Lear is repeatedly called old and admits as much to Regan. He has "white hair" and is "infirm" and "weak with age." Physical exposure and "passions and perturbations of the mind" leave his body cold, dry, and weak. His mind also shows effects of decay. His memory fails, he grows talkative, and he fears approaching madness. He has illusions of sight, raves, and imagines Kent and Edgar as judges in a court condemning his two older daughters. Toward the end of the fourth act his cure begins by the medically accepted means of music and complete rest. However, his final tragedy of death is brought on by the defeat of Cordelia. Thus Lear is a case-history of physical and mental decay brought on by misfortune and advancing years.

The details of Lear's old age are Shakespeare's own, for the story from which he took his idea did little more than mention the King's old age. "One foot already hangeth in the grave," and early in the play Lear admits that his "pale grim death approaches." Nor does he go mad as in Shakespeare's play.

As Shakespeare worked over this material to make it express even more strikingly the dangers of abdication and division—subjects especially dear to the heart of his patron, James I—he found that he needed a tragic conclusion and that Lear must be extremely old to have a motive for relinquishing his kingdom.

Shakespeare portrays several stages of man's latter years: Polonius in his forties or early fifties is still a competent prime minister; Falstaff in his sixties still tries to cling to green old age and uses stimulants and his wit in order to pass for a younger man. Shallow, Nestor, and Lear are all in their eighties. His portrait of Lear is filled in with

detail, both physical and psychological with no satiricial treatment as he shows in Falstaff or in Shallow.

An insight and sympathy for old age grew upon Shakespeare so that he ends by idealizing age as much as he had ridiculed it some fifteen years before. Also, his depth of psychological insight grew, in Falstaff who shows the fear of advancing years and of getting old, in Shallow who glorifies his youth, but most of all in Lear who bows and breaks before the late storms of life.

GERONTIUS RESARTUS

Gerontius pertains to man well past the age of dancing,
Enfeeblement that comes with age will, like toxins, stimulate
Recruits in Geriatric Art to keep men young much longer.
On age alone, no one need be less perfect than Apollo,
Nor will they see that wrecks of time may not be strong as Samson.
Time brings no sad, no bad effect that they cannot well direct
Into the fields Elysian, where the good gerontii
Unhampered by the tides of life, are ever grateful to you.
Soon there they find old men may dream, and like the young see visions.
Revitalized Gerontos may live better than when younger.
Enlightened by experience he avoids the garish life;
Strong again despite youth's blunder, like Hippocrates he knows
Art is long, all life is short, and the ghost of Panacea
Resplendent lives in cure-all fads, that may cut life still shorter.
The cure for every fad is found in the art Hygeia built.
Until old age comes creeping on with many an ache and qualm, you
Surely may not need the balm well known in geriatrics.

H. A. McGuigan

CURRENT COMMENT

The Fountain of Youth

Man, since the beginning of time, has sought the fountain of youth. Even in ancient Egypt a transcriber of a treatise on medicine and surgery, now known as the Edwin Smith Surgical Papyrus, jotted down some notes on old age, the caption of which is reproduced at the top of this page.

The Precolumbian Indians of the West Indies had a legend of the land of the "Bimini," wherein there was a fountain, the waters of which had marvelous curative powers. Ponce de Leon, while Governor of Porto Rico, heard the legend and set sail with three ships to find the fountain. Although he failed in his original purpose, he did discover "The Island of Florida."

Even our American comics took cognizance of the fountain of youth when a few years ago Mandrake the Magician exposed a pseudo-rejuvenation scheme.

It is evident to those who understand the principles of life and death that the life of a single individual is not immortal. Our efforts

The establishment of the JOURNAL OF GERONTOLOGY has been made possible by a grant from the Josiah Macy, Jr. Foundation in support of the editorial office.

The hieroglyphics, "The Beginning of the Book for Transforming an Old Man into a Youth," at the top of this editorial page, are from the Edwin Smith Surgical Papyrus, translated by Professor John Breasted, University of Chicago Press.

must be directed to prevention of the diseases and infirmities of age so that life in those years may be happier. The Fountain of Youth of Ponce de Leon and the Book for Transforming an Old Man into a Youth of the Early Egyptians were explorations for something beyond their reach, explorations into the great unknown.

What kind of fountain of youth are we seeking: A fountain that will miraculously erase the wrinkles of age, or a fountain that will make the later years of life a healthy and intellectually occupied period? Truly the expression on the front cover gives expression to the modern attitude toward the quest for the fountain of youth—"To add life to years, not just years to life." To this end the JOURNAL OF GERONTOLOGY is dedicated.

The Real and the Realizable

War is a relentless driver. Survival of the people and of the nation hangs by a thread, and there is the cry of "On to greater effort! Do not overlook anything! There is not a second to lose!" The laborer, the business man, the scientist are all sucked into the whirlpool of utilization of every fragment of knowledge. Under the stress of conflict, in five short years, have come the first splitting of the atom, radar, planes with a range of 5,000 miles, and bombs guided to the target by television sets in the nose, to name only a few of the more spectacular and destructive. On the constructive side are penicillin, D.D.T., greater cooperation between nations, and the hope of a lasting peace in the United Nations Organization.

Through the ages, pure science has been years, decades, or centuries ahead of applied science and the harnessing of nature for the benefit of man. Today the nuclear physicists have presented to man the overwhelming force of atomic energy before the social and political interrelations of nations are ready. Whether it takes the latter a decade or a century to catch up may well determine the fate of the next generation.

It is the same story with the results of medical research. Only in the last thirty years has anything approaching the full benefit of vaccination against smallpox been realized. Yet, Jenner demonstrated the efficacy of the procedure in 1798. In World War II the completely attainable values of modern preventive and curative medicine were unfolded by the Armed Forces. The application of these techniques

to large parts of the world may well change the economic position of countries and continents.

Day dreaming and planning for the future should not exclude the job to be done in the present. With simple arithmetic we may calculate the effect on life expectancy today if there were full utilization of medical knowledge under optimum conditions. The real—in 1938 the chance of a newborn child living to age 50 was 81.7 per cent. The realizable—86.7 per cent. In other words, with no additional facts, but only acceptance of what is known, another 5 per cent of children may live through the most productive period of life.

Why can not the will to live, the chance to survive, be as strong in peace as in war? Support measures to promote health, which is only one aspect of happiness.

The Debt of the Survivors

Dr. Louis I. Dublin, third vice-president and statistician of the Metropolitan Life Insurance Company, has stated that "thirty per cent of the persons who have attained the age of 65 today owe their survival to the advances in medicine and public health as well as in general public welfare which have been made since they were born." (University of Pennsylvania, Bicentennial Conference.)

The basis for this conclusion is a new method of analysis of life-table data; a comparison of expected survivorship of a large number of babies born at some time in the last century, under mortality conditions then prevailing, with what actually transpired among them in the period of their lifetime.

For example, of 100,000 babies born in England in the year 1876, mortality rates at that time predicted that 42,000 would survive to the age of 50. But, as the years passed, mortality decreased and 53,000 actually were alive in 1926. This was a saving of 11,000 lives or 20 per cent.

If the same calculation is made for age 65, the net increase of survival is 30 per cent. This is the real contribution of pure and applied science to the economic and social welfare of a nation. But research is expensive. Men and women must be trained. Expensive equipment and supplies must be available. Two atomic bombs cost two billion dollars, a billion dollars apiece. Even in war this is a large

sum. But someday when atoms are split in engines and not in bombs, the price will be considered cheap.

It is an accepted principle in business that some of the profits are "ploughed back" for development and expansion. The people of a nation and of the world constitute the sum total of all business. Thousands are alive, happy, and productive today because in the past a relatively few had a consuming curiosity to unravel the laws of nature, and a relatively few others were willing to give them a financial "stake."

The attitude of "let John do it" cannot continue forever. The great fortunes and foundations have made and are making a contribution. Recently attacks have been made on two diseases by national groups supported by small gifts such as the March of Dimes-infantile paralysis, and cancer.

The man and woman 50, 65, or 75 years old in 1946 might say, "I am alive today because someone in 1900 gave money and time to support research on a better way to treat pneumonia. Perhaps if I were to give a little now, my children in the year 2000 will be happier, healthier, and more prosperous than I am." The interest in mental satisfaction on an investment in the future is far greater than the interest in dollars on an investment in the present.

When Old Age Begins

The editor has been asked many times in the last year when old age begins. Or, the more practical inquired, "Reports of investigations of patients beyond what age are acceptable for publication?"

The answer to the first question may as well be the expression "a man is as old as he feels." A more dynamic form of this thought was given by Fibber McGee when someone made a disparaging remark about his gray hair—"Just because there's a little snow on the roof doesn't mean the fire's out in the house." But, more seriously, gerontology is concerned with all aspects of aging. The changes need not occur in the chronologically older animal organism.

Extension of Social Security

According to a United Press dispatch of August 14, 1945, Congress will soon be asked by President Truman to make the social security

act "a more perfect instrument for the maintenance of economic security."

Reports from Federal Security Administrator McNutt show that $9,000,000,000 in social security payments have gone to individuals since the act was signed in 1935. The ten year total of payments comprises $900,000,000 under old age and survivors' insurance.

The President stated, "Social security has become an essential part of the American way of life. But while we have made progress, we still have a long way to go before we can truthfully say that our social security system furnishes the people of this country adequate protection. Social security worthy of the name is not a dole or a device for giving everybody something for nothing. True social security must consist of rights which are earned rights—guaranteed by the law of the land."

Surgery for the Aged

A more progressive outlook toward surgery for the aged, the result of great advances in medicine, should begin to take the place of the old pessimistic view on the part of both physicians and family, according to Louis Carp in his article in *Hygeia* for August, 1945.

"Old age does not necessarily prevent surgical procedures which may save or prolong life, produce continued physical comfort, and add economic, functional, and social usefulness."

Advancing years usually bring on degenerative diseases which affect human tissue in many ways. The heart, blood vessels, lungs, liver, kidneys, bladder, and brain are perhaps the most often affected. Speed, gentleness, and good judgment are essential during an operation on an old person. Often if the person's condition cannot stand too long an operation, it is possible to complete it at a later date, says Mr. Carp.

The human life span has been increasing until in another fifteen years life expectancy should reach seventy-five years. Because the life span is increasing, surgery for the aged is creating a greater challenge for doctors. Old people should adopt a more hopeful outlook toward surgery because of the great advancements in modern methods and scientific practices. This whole program calls for cooperation on the part of old people when a condition demanding surgery arises.

Shaw and Beveridge

July 26, 1945 saw George Bernard Shaw chalk up his 89th milestone busy as ever on his plays, one of which soon will be seen on the screen. After his birthday silence Mr. Shaw said of the new Attlee Government, "I shall not inflict my congratulations on the Labor ministers. They have come into an unholy mess of bankruptcy and ruin." To Sir William Beveridge, defeated candidate, he had an I-told-you-so: "His defeat will teach Sir William that the Liberal who goes out of his way to disavow Socialism is doomed."

Toward a Longer Life

Our increasing span of life in America has been influenced materially by successful attacks on many of our hazardous diseases until today life expectancy reaches sixty-two years. The extension of known methods of disease control is capable of definitely increasing that span even more, say J. Arthur Myers and Virginia L. Dustin in an article, "Toward a Longer Life," in *Hygeia* for May, 1945.

Most of that which has been accomplished toward increasing the life span has been brought about by controlling diseases in younger age periods, especially childhood.

The study of old age and the diseases pertaining to it has been receiving considerable attention of late, say Mr. Myers and Miss Dustin. Many of the conditions of declining years are not adequately understood and there is still some question as to whether or not they will ever be completely controlled. However, many of these conditions even now can be treated so as to prolong life.

"There comes a time in the life of every living being when, after passing the height of vigor and vitality, degeneration begins. Man passes through years of growth and reaches the height of his strength and power with every manifestation of physical and mental vigor; however, there comes a time when proof of degeneration and decline appears.

"While the span of human life has been definitely extended and may be further increased by the prevention of diseases which have taken their toll among the young, it seems doubtful that science will ever be able to thwart nature when the time comes for degeneration and death. Indeed, it is not death in old age that we lament or are

trying to prevent; it is the prevention of death before people have had opportunities to enjoy life and make their contributions to the world."

As to the question of over-populating the world by increasing the life span, according to the authors, the day is coming when man will live happily and comfortably in the tropics and it will become the center of world wealth, civilization, and population.

Basic Wants of Older People

According to Leo W. Simmons, the four general basic wants of all old people include (1) to live as long as possible, (2) to remain active participants in group and personal affairs, (3) to safeguard any prerogatives acquired in long life, such as skills, rights, and prestige, and (4) to withdraw from life as honorably as possible. In his article, A Prospectus for Field Research in the Position and Treatment of the Aged in Primitive and Other Societies, appearing in the *American Anthropologist*, vol. 47, no. 3: 433–38, 1945, Dr. Simmons stresses the need for more detailed and extensive studies before it is possible to draw any good picture of the aged in primitive societies. However, he does say that the onset of old age in most primitive societies was more gradual, with more opportunities for old people to make and continue to make contributions. See the article by Professor Simmons on page 41 of this number of the JOURNAL OF GERONTOLOGY.

Employment Opportunities

According to a survey of personnel and employment managers of manufacturing and retail concerns by the Family Economics Bureau of the Northwestern National Life Insurance Company, older people will find much broader employment opportunities in the postwar era than they found in the prewar period.

Although many concerns have deep gaps in their 20–30 age group of employees and will recruit intensely in this age group to maintain a balance, the old hard and fast age limitations have been pretty thoroughly broken down and will stay so in many fields.

"Age? We don't put so much importance on it any more," said one employment manager. "Some people act younger and are more alert and vigorous at 50 than other people at 25 or 30."

Many employers who have had unsatisfactory experiences with irresponsible young employees during the wartime labor shortage express a definite preference for older workers, who may take a bit longer to train, but who are faithful, loyal, and dependable. In the office and store fields, women employees dominate the picture; older office women were generally reported surprisingly adaptable, a bit slower at learning, but more reliable than youthful applicants.

Older workers are generally divided into two groups by personnel and employment executives: those between 40 and 50 and those over 50. Reports show that those employees in the 40–50 bracket are adaptable, learn fairly quickly, and are satisfactory almost anywhere in a plant. Regular employees in this group were the mainstay of many concerns during the war and were definitely superior to the youthful wartime personnel available. Their records of sickness and absenteeism were almost as favorable as those of the younger group.

A typical report from a large Cleveland war goods factory shows that, of employees over fifty, 75 per cent did their work well. However, many of the women employees in this age group could not stand the extra pressure of wartime production. New employees of both sexes in this group generally had to be placed in carefully selected jobs where they did not have to lift weights and were not exposed to heat or smoke. Absenteeism and turnover in this age bracket have generally been high.

In department store work, most workers over 50 cannot be on their feet for any length of time and therefore are placed in such jobs as wrapping, marking, taking phone orders, and other jobs where they can be seated and which do not require much pressure.

One St. Louis department store manager stated that although they would recruit heavily in the younger age brackets in order to balance the personnel, they will no longer have fixed age limits. "Individual qualifications will determine acceptance or rejection."

One Chicago executive, however, had an opinion somewhat contrary to the general report. Said he, "Against a generally satisfactory experience with older employees, we have found that where an older woman, married, and without previous business experience is given her first job in our store, she almost invariably upsets her entire department in a few days with personal gossip."

Live Long and Like It

An exhibit, "Live Long and Like it," augmented by the Cleveland "Golden Age Hobby Show" on display November 15 to December 10 at the Cleveland Health Museum, proved one of the most popular ever shown there.

The exhibits showed the increasing proportion of older people to the total population and portrayed the economic status of many of the old people, as well as their opportunities for recreation.

Exhibits prepared under the direction of Dr. Bruno Gebhard, director of the Cleveland Health Museum, included: More People Live Longer, Population Over 65, the Four B's: Baldness, Bifocals, Bridges, and Bulges, Our Organs do not Age Simultaneously, Prevalent Chronic Diseases, Social Security, Jobs After 50? How Grandma Helped on the Home Front, Food as You Like It, Youthful Old Age, Social Clubs and Recreation, and Institutional Care.

If any evidences were needed for the worthwhileness of an exhibit directed to the older age group, the Hobby Show furnished it. More than 1,200 exhibits were displayed by 235 exhibitors. Practically every craft and domestic science was represented.

Mr. Lawrence K. Frank, director of the Caroline Zachry Institute of Human Development, spoke at the opening exercises. (See page 4 of this issue for an article by Mr. Frank.) He premised his talk on the fact that there has been a threefold increase of people over 65 since 1900. "Old age security, through pensions and retirement allowances, is a first step but not enough, since it may only intensify the tragedy of old age if not accompanied by more and better adapted facilities for medical and health care, for mental health and personal guidance, for leisure time pursuits, for housing and community planning, and for worthwhile activities which will permit aging people to maintain their feeling of independence.

"There need be no pessimism about aging, since today we have immense new resources, new knowledge, techniques, and skills, and a new understanding of nutritional requirements of the aged.

"Here is where there is an imperative need for guidance to help each individual man and woman plan a design for living which will include the kind of activities each likes and can do—hobbies, arts and crafts, anything in which they can feel they are competent and can still master situations and handle material."

Fun at Sixty

After an elderly woman in Philadelphia committed suicide for apparently no reason other than that she was lonely and had nothing to occupy her time, a minister of the Christ Methodist Church took hold of the problem. (Everybody's Digest, January, 1946—condensed from Christian Advocate.) Enlisting the aid of the Philadelphia Council of Social Agencies, he established the Golden Age Club, a recreation center to combat the ravages of old age. Its regular weekly meetings, financed by the churches, offer movies, book reviews, hobby programs, picnics, and boatrides. But more important, it offers elderly people a place to go, something to do, and something to look forward to each week. It gives them a chance for companionship, recreation, and something to do besides brood over their troubles or past memories.

One elderly man brings each week a neat little bundle tied in a newspaper. It is his mending which the women gladly do for him. Since his wife's death there had been no one to do such things and they were left undone.

Weekly postcards, sometimes the only mail a member receives, are sent to everyone announcing the next program.

Similar clubs in all communities are well worth consideration by private groups and government.

Personal

It is customary for retiring editors to sing a swan-song in words on the editorial page. The happy associations of ten to thirty years are recounted, and the assistance of many is gratefully acknowledged.

All human undertakings recapitulate the life of man himself; the idea is conceived; there is a period of gestation or planning; and, finally, comes the great day of birth, followed by a long stage of growth or expansion.

Although this issue, Volume 1, Number 1, of the JOURNAL OF GERONTOLOGY appears for public view in the winter of 1946, the preceding months and years of gestation deserve recognition before the editor retires. The day of conception was in February 1944, when a committee of the Club for Research on Ageing was appointed to investigate the desirability and feasibility of publication of a journal. Quickening occurred on February 9, 1945, as the committee reported

that life could be discerned and suggested that an editor-in-chief be appointed.

During the past eleven months the editor has received encouragement and advice from many. The members of the committee on publications, Roy G. Hoskins, Lawrence K. Frank, Edward Stieglitz, and William deB. MacNider, the consultants to the editor, and those on the advisory editorial board have given generously of their time and thoughts. The authors of the papers in the early numbers have in some way crowded more hours into the twenty-four to complete their contributions. The publishers, Charles C Thomas and Payne Thomas have never wavered in their cooperation and enthusiasm. The assistant to the editor, Peggy Bronson, has entered into the spirit of the project and contributed much. The significance of each section has been expressed with pen and ink by Mary Lou Rice, who designed and executed the special headings.

All of these with the editor may be looked upon only as associate obstetricians. The obstetrician has been, and the pediatrician for early infancy is the Josiah Macy, Jr. Foundation. Without the sympathetic understanding and support of the Foundation and its medical director, Frank Fremont-Smith, the diagnosis might have been just pseudocyesis.

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BOOKS

MEDICINE AND DRAMA

THE HUMORS AND SHAKESPEARE'S CHARACTERS, John W. Draper, Duke University Press, Durham, North Carolina, 1945, $2.00.

The brilliant Elizabethan period and one of its by-products, the Shakespearean plays, might be compared to a piece of fine old silver. Each succeeding generation has deposited a thin film of change, a variation of society, language or thought. The scholar must burnish the silver and restore the original lustre so that we of today may see through the eyes of the commonality of Seventeenth century England. With this viewpoint Professor Draper, professor of English at West Virginia University and who has written over sixty papers about his subject, approaches the problem of Shakespeare's attitude toward humankind and how he built his character-creations in terms of the contemporary medical thought. He would have us ask why Hamlet, during his assumed madness, answered the trouble inquiries of his mother with

> My pulse, as yours, doth temperately keep time
> And makes as heathful music; it is not madness
> That I have utter'd.

To us this means little or nothing, but to the Elizabethan audience the words were proof that Hamlet was not insane. Why? Because there was a medical aphorism, derived from Galen's De Pulsebus, that an irregular pulse was a sign of lunacy. It is known that Shakespeare was familiar with some of the works of Galen in as much as he referred to him by name at least once.

For many centuries before and for a few centuries after Shakespeare, thought on the nature and cause of disease revolved about the four humors—blood, phlegm, white bile, and black bile. In fact, a preponderance of one of the humors determined the character and reactions of the person. The humors thus conferred types: respec-

tively sanguine, phlegmatic, choleric, and melancholy. In turn each humor and type was associated with a certain planet, constellation of the zodiac, hours, days, seasons, colors, metals, diseases, time of life, special situations and events, professions, vocations, and the like.

After an introductory chapter of background, Professor Draper systematically discusses the characters of Shakespeare in terms of their type: The sanguine lover is handsome King Navarre in *Love's Labour's Lost;* the phlegmatic man, soft and sluggish of body, timid of spirit, and dull of mind appears as Benvolio in *Romeo and Juliet;* the varied choleric temperaments clash in *Othello;* and the melancholy type is used to represent the disappointed lover and old man. Then, as on all occasions when mere man sets up a classification, some are left over. Draper treats these in a chapter on the Balanced and Mercureal Types and on Counterfeit Types.

The melancholy type is the opposite of the sanguine—cold and dry—and hence is appropriate for old age. At the time of Shakespeare there was general agreement on the physical characters of the melancholy man. Lemnius described "body ill favored, leane, dry, lank, pylde skinned and wythout hair,—brooked—worne wyth sicknes and old age." In Draper's opinion this depiction of old age appears in *King Lear,* in York in *Richard II,* in Hamlet's lean beggar, in Jacques's "lean and slipper'd pantaloon" who needed spectacles and spoke in "childish treble"; and in the "lean Cheek" that Rosalind noted as the indispensable mark of love melancholy. [An article by Professor Draper on this aspect of the subject appears in this number of the JOURNAL OF GERONTOLOGY.—Editor.]

The theme of the book may be summarized in two quotations: "A modern novelist in his characters may depict the operation of heredity or environment; but the operation of these forces does not necessarily preclude their own freedom of decision, for men can change environment and sometimes circumvent heredity; and Shakespeare's figures, likewise, are portrayed, not the mere slaves, like Johnson's, of their humor, but struggling or succumbing as men do in actual life—as masters or as servants of their tendencies innate at birth or acquired by profession, age, or situation among their fellows. Thus, within the complex pattern of the humors, the dramatist shows the impress on human character of social environment and (if not of heredity) at least of those astrological accidents of birth that somewhat took its place in Renaissance belief."

"The past, therefore, should be explored down more than one converging road; and, though medicine and drama may at first glance seem unrelated, the need of the latter for psychological expression forges a major link; and thus contemporary medicine is one vista through which Shakespeare's characters can, and should, be viewed; for it is the way that the Elizabethans themselves viewed his vivid and complex creations."

ROBERT A. MOORE

MENTAL GERIATRICS

MENTAL DISORDERS IN LATER LIFE, Oscar J. Kaplan, Stanford University Press, Stanford University, California, Humphrey Milford: Oxford University Press, London, 1945, $5.00.

A striking parallel between the development of child psychiatry and mental geriatrics is evident. It has been only a few decades since textbooks of psychiatry, when discussing child psychiatry, confined themselves to extreme cases which required nothing but custodial care; all we learned about them were outspoken cases of amentia. In the meantime a vast borderline has been opened. Maladjustment, neuroses in childhood, distorted parent-child relation, and many problems which occur within the physiological range of development form the main subject of child clinics today, and those classical textbook conditions have lost their relative importance.

The last few years indicate a similar trend in mental geriatrics. "Mental Disorders in Later Life" is the first significant token of this development. The book is edited by Oscar J. Kaplan, professor of psychology, University of Idaho, and consists of chapters written by sixteen authors. It is impossible to discuss this book in detail; the best way to give an idea of its scope is to enumerate the chapter headings: "Introduction" (Karl M. Bowman); "A Statistical Review of Mental Disorders in Later Life" (Horatio M. Pollock); "Physiological Aspects of Mental Disorders in Later Life" (Nathan W. Shock); "Psychological Aspects of Mental Disorders in Later Life" (Harold E. Jones and Oscar J. Kaplan); "Sociological Aspects of Mental Disorders in Later Life" (H. Warren Dunham); "Mental Health and Nutrition in Old Age" (L. Erwin Wexberg); "Neuroses of Later Maturity" (Norman Cameron); "The Involutional Psychoses" (Eugene Davidoff); "The Presenile Dementias" (George A.

Jervis); "Senile Psychoses and Psychoses with Cerebral Arteriosclerosis" (David Rothschild); "The Toxic Delirious Reactions of Old Age" (G. Wilse Robinson, Jr.); "Older Mental Patients after Long Hospitalization" (Eugenia Hanfmann); "The Aged Subnormal" (Oscar J. Kaplan); "Psychosomatic Medicine and the Older Patient" (Bela Mittlemann); "Psychotherapy in the Older Individual" (Fred V. Rockwell); "Mental Hygiene in Later Maturity" (Nolan D. C. Lewis); and "Orientation of the Problems" (Edward J. Stieglitz).

It is amazing to see the amount of factual material accumulated since those not so distant days when "involution and senescence" evoked in psychiatrists only one single association—"asylum." Hence the most impressive pages are those which deal with psychotherapeutic, sociological, psychoanalytical, and psychosomatic avenues to the problem, with neuroses in the higher age group and with psychological and physiological aspects of old age disorders. Frequently in books of this type the reader receives a definite impression of the editor's own leanings, whether they are somatic or psychological. This is carefully avoided here, and the editor has succeeded in balancing diverse elements against one another. Overlapping has been avoided as much as possible, not only of various chapters with one another but also of the whole book with general handbooks of gerontology, such as Cowdry's. This is the possible reason why in places the style of the book is too compact and terse so that it seems to consist of an enumeration of references, and some chapters appear altogether too short, e.g., the one on "Mental Health and Nutrition in Old Age." The same is true with regard to certain neurological aspects of old age, for instance, senile Parkinsonism and other extrapyramidal disturbances which have certain psychiatric implications. Some overlapping on these subjects with general geriatric manuals would not have done any harm. Shock's otherwise excellent chapter on physiology might benefit from an enlargement on certain topics, e.g., physiology of steroid hormones during involution.

Apart from these minor details there is no doubt that this first comprehensive book on mental geriatrics has a good chance to remain the standard work on the subject.

KARL STERN

CARE AT THE END OF LIFE

THE CARE OF THE AGED, THE DYING, AND THE DEAD, by Alfred Worcester, Charles C Thomas, Springfield, Illinois, 1945, $1.50.

This small book appearing now as the second printing of the second edition, is divided in accordance with the title into three chapters—care of the aged, care of the dying, and care of the dead. Each is a lecture at the level of the medical student and young physician. The emphasis is on the art of medicine rather than the science of medicine, as exemplified in one quotation: "In the practice of our art it often matters little what medicine is given, but matters much that we give ourselves with our pills."

The author, a student under Oliver Wendell Holmes, was long professor of hygiene at Harvard University. Each of the three chapters was originally presented as a lecture and published in medical journals.

In care of the aged moderation and individualization are emphasized. There is little new in detail, but the viewpoint of the family physician as friend and counsellor is well presented. "In normal senescence labor naturally becomes less fruitful, but life, while lacking the ecstasies of springtime, yet has in it the peaceful warmth of autumn; and nearer its normal end, it should be expected not to have the winter of discontent, but rather the lovely haze of Indian summer. To guard and promote such normal senescence, I hold to be one of the physician's great privileges."

Included in the chapter on care of the dying there are descriptions of the signs of impending death, a discussion of the pros and cons of whether or not there is a physical and/or an emotional agony of death, and an interesting consideration of when and how the patient and the family are to be informed of the approaching event. "Devotion to the truth does not require the physician to voice his fears or tell his patient all he thinks he knows."

The last chapter—care of the dead—is a polemic against modern burial methods in America. Expenditures for elaborate funerals and caskets are denounced, and fear is expressed that before long too much productive land will be converted into cemeteries.

ROBERT A. MOORE

A FORMULA FOR LONGEVITY

THE SECRET OF A LONG AND ACTIVE LIFE, by Frank Linden, privately published, 1943, $1.00.

Many older people have a personal formula, prescription, or set of rules which in their sincere or commercial belief is the basis for a long life. Some go to the lecture platform, others organize companies to sell the idea or necessary apparatus, and still others publish small or large books. Mr. Linden, whose real name is Frank Linden Andrews, an investment-banker and an apparent lover of horses, has chosen to record his rules entitled "The Lesser Ten Commandments" in a small book of sixty-four pages, endorsed by the Better Life Foundation of Fall River, Massachusetts. Mr. Linden has also written "A Layman's Creed" and is now preparing a series of articles to be published in book form on "A Layman's Views" giving his reflections on Faith, Prayer, and Evil.

Few physicians will quarrel with the ten lesser commandments—give thyself fresh air, keep thy mind and body active, give thyself good food, give thyself sufficient sleep and rest, keep thyself clean inside and out, give thy lungs full play, work and play, practice self-control, take regular health check-ups, "think on these things." All the commandments are to be taken in moderation.

Many physicians will have serious question about the strict scientific accuracy of some of the side remarks: that exercise from rings suspended in a doorway may increase the height up to one-half inch; that when we bend and stretch, we constrict our cells and help to shed the dry tissues; that it is "agreed by outstanding medical authorities and specialists that habitual smoking shortens life appreciably and that it is more harmful to females"; that the dog has constipation because he is man's responsibility; and that bacteria in the colon through the eating of meat are one of the major causes of old age.

Yet there are many words of good New England common sense: "We must keep open minds, science above all"; "Man has apparently conquered pretty much everything he has tackled except himself, on whom he has done a rather poor job to date"; "Have a hobby"; and "Work is a panacea for many if not most of the ills which flesh is heir to."

In summary, this book is one of the personal formulas for living to a ripe old age. It was successful for one man, but will not necessarily apply to others. There are multiple factors, such as heredity, constitution, environment, and many others still unknown which control longevity.

ROBERT A. MOORE

PERSONAL REFLECTIONS

A SURGEON LOOKS AT LIFE, by Richard A. Leonardo, Froben Press, New York, 1945, $2.00.

It is a well recognized prerogative of those who have attained mature years to use the printed word to record for posterity their experiences, adventures, and philosophies. Dr. Leonardo began before 1942 to do just this and thus is following his own advice: "After the problems of education, a career, marriage, and a family have been met, the individual's interest and energy are freed from personal problems to be turned toward those of his community and society." So far there have come from his pen five books, *American Surgeon Abroad*, *History of Surgery*, *History of Gynecology*, *A Doctor's Advice to Women*, and *A Surgeon Looks at Life*, and there are four more in preparation. Dr. Leonardo was formerly city coroner for the City of New York and has spent a good deal of time traveling abroad.

In this latest addition to the series, *A Surgeon Looks at Life*, there are tidbits of information on the history of Christian Science, on the controversy over the Freudian theories of infantile sexuality, and on the use of the cornea from dead persons to alleviate blindness. Many larger problems such as euthanasia, juvenile delinquency, contraception, and abortion are dealt with. But the gaze of the surgeon looking at life penetrates even beyond things material and comes to rest on broad philosophies of "What am I," "What is the world," and "Life after death." The summary of the surgeon is: "If each individual does his utmost in this life to live up to his beliefs, alleviate suffering, to further research in his own field, contribute to civic improvement, and leave his family financially protected, what more can he hope to achieve"?

Even if the reader does not agree with the reasoning and conclusions, he will find realistic and frank treatment of the subject. For

example, the social and religious aspects of birth control, abortion, and sterilization are met head-on. A few quotations will suffice to illustrate: "Psychological causes of abortion cannot be legislated out of existence . . . ," "The mother's life is worth more than the child's . . . ," "Legislators can pass laws, but only public opinion can enforce them."

In general attitude, the author accepts benevolent paternalism of government but still holds tightly to freedom. In discussion of juvenile delinquency he says, "These facts prove beyond question of doubt that a totalitarian regime is a more effective machine, but what we in America have to decide is whether or not we wish this solution of our problem. Are we willing to eradicate juvenile delinquency at the cost of freedom? Or have we the moral fibre and determination necessary to regain family control of our youth . . . ?"

The chapter on "Gerontology and Geriatrics" is a synopsis in nine pages of all areas of these subjects. A phrase, sentence, or paragraph touches on population trends, nature of the aging process, diagnosis of disease in the aged, value of periodic health examinations, rejuvenation and sex hormones, emotional life of the elderly, the clash of generations, and the economic and social place of the older generation. There are no new ideas or viewpoints but in general sane treatment of those known before. In consideration of the clash of old and young, there is the usual bluntness—"An otherwise harmonious home should not be disrupted because of false sentimentality toward either party —and the welfare of the children should be considered of paramount importance." Somewhat different is the concluding paragraph of this chapter: "All changes due to age are not deteriorations; on the contrary, age may bring greater wisdom, maturity, experience, mellowness, and tolerance. Could we face a world in which everyone over the age of fifty had been eliminated? I doubt it."

ROBERT A. MOORE

LADIES OF QUESTIONABLE AGE

HIGH TIME, by Mary Lasswell, Houghton Mifflin Company, Boston, 1944, $2.00.

When three women of questionable age start out to do something about the war effort, things happen. Unfortunately, Mrs. Feeley,

Miss Tinkham, and Mrs. Rasmussen of *High Time* find they are a bit too antiquated for war plants, although Miss Tinkham strongly asserts that "mere callow youth is not always sufficient equipment to cope with emergencies such as may arise in total war. It seems that ladies of more mature experience and riper philosophy would be better equipped." Such a typical remark of advancing years!

And so their war efforts consist of caring for a pair of lusty-lunged twins appropriately named Franklin and Winston so that their mother can keep her job in a war plant. These twins give the author a brilliant opening to take a stab at the child psychologists, which she very well does.

Besides this small scale day nursery, the ladies undertake a Travelers' Aid, a Dorothy Dix, and a Mr. Anthony service. Then there is a boarding table for six war workers whose hemoglobin is a little low due to the poor food restaurants have to offer these days. Their entire services are liberally interrupted during each day for the ladies' relaxing bottles of beer. As Mrs. Feeley put it, "Beer pads the ends o' the nerves with little fat cushions."

In between non-serious conversation there is occasionally a philosophical comment which clearly reflects the age of the ladies. Miss Tinkham, horrified, exclaims, "I, for one, have never associated with old people and I have no intention of beginning now!" Attempting to eat salted peanuts, Mrs. Feeley grins and says, "I ain't got no teeth, but I can sure gum hell out of 'em."

Then there is Miss Tinkham's glamorous outfit, obviously saved from some previous age and brought out only on gala occasions. The skirt was a good sixteen inches longer than the current fashion, but "everyone knew how knitted fabrics raveled when cut, and besides the material was so handsome." The sweater top was a dazzling affair embroidered in sequins and crystal beads.—The final touch, the coup de grace of a handsome picture hat made of accordion-pleated Kelly green lace with a shallow crown and a wide, oval brim, completed her costume.

The author, Mary Lasswell, has added *High Time* as a sequel to her first book, *Suds in Your Eye*, in which she introduces the three old ladies and starts them on their merry adventures.

PEGGY BRONSON

BOOKS RECEIVED

Books received since July 1, 1945, are acknowledged in the following list. Insofar as space and time permit, some will be selected for review in a later issue, but it is unlikely that all will be reviewed.

A SURGEON LOOKS AT LIFE, by Richard Leonardo, Froben Press, New York, 1945, $2.00, 128 pages. (Reviewed in this issue, page 69.)

THE HUMORS AND SHAKESPEARE'S CHARACTERS, by John W. Draper, Duke University Press, Durham, North Carolina, 1945, $2.00, 126 pages. (Reviewed in this issue, page 63.)

THE CARE OF THE AGED, THE DYING AND THE DEAD, by Alfred Worcester, Charles C Thomas, Springfield, Illinois, 1945, $1.50, 77 pages. (Reviewed in this issue, page 67.)

THE SECRET OF A LONG AND ACTIVE LIFE, by Frank Linden, Privately published, 1943, $1.00, 64 pages. (Reviewed in this issue, page 68.)

THE ROLE OF THE AGED IN PRIMITIVE SOCIETY, by Leo W. Simmons, Yale University Press, New Haven, Connecticut, 1945, $4.00, 317 pages. (An article by Dr. Simmons on the same subject appears on page 41 of this issue.)

OLD AGE, SOME PRACTICAL POINTS IN GERIATRICS, by Trevor H. Howell, H. K. Lewis & Co., London, 1944, 4s6d, 50 pages.

CASS TIMBERLANE, by Sinclair Lewis, Random House, New York, 1945, $2.75, 390 pages.

BIOLOGICAL SYMPOSIA VOLUME XI, edited by Jaques Cattell, The Jaques Cattell Press, Lancaster, Pennsylvania, 1945, $3.00, 242 pages.

TRAUMA IN INTERNAL DISEASES, by Rudolf A. Stern, Grune and Stratton, New York, 1945, $6.75, 575 pages.

OLD AGE IN NEW YORK CITY, by Helen Hardy Brunot, Welfare Council of New York City, 1943, $1.50, 125 pages.

PHYSICAL CHEMISTRY OF CELLS AND TISSUES, by Rudolf Hober, The Blakiston Company, Philadelphia, 1945, $9.00, 676 pages.

NEW GOALS FOR OLD AGE, by George Lawton, Columbia University Press, New York, 1944, $2.75, 210 pages.

MENTAL DISORDERS IN LATER LIFE, by Oscar J. Kaplan, Stanford University Press, Stanford University, California; Humphrey Milford: Oxford University Press, London, 1945, $5.00, 436 pages. (Reviewed in this issue, page 65.)

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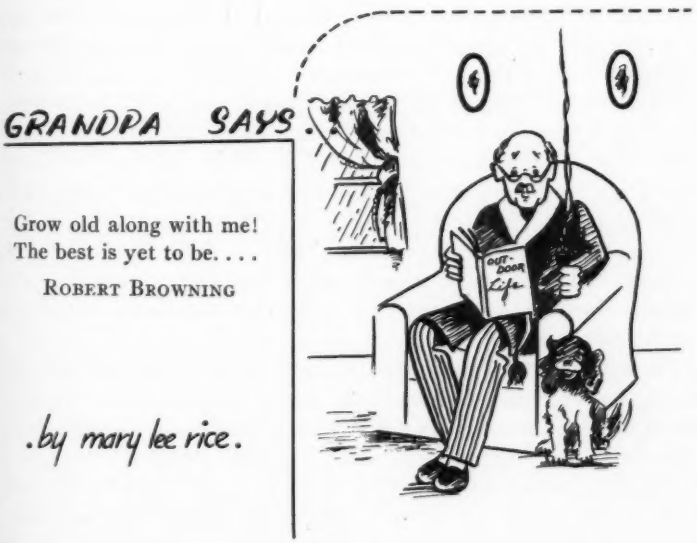

In the following glossary there are examples of at least four general principles of medical terminology.

The prefix "a" or "an" (achylia, anesthesia, ascorbic, and anemia) is used in medical terminology to negate the root word. Thus achylia is "no chyle," and anemia is literally "no blood." In all early Indo-european languages a vocalized "n" (n̥) was used in this sense, probably originating in much the same way as the Midwestern American grunt for no—"uh-uh." In Greek the "n" became "an" and before roots beginning with a pronounced consonant, the "n" was dropped. In Latin the "n" became "in" or "im" such as the English impossible. In English, for words from Anglo-Saxon, the Greek "n" is usually "un" as unreliable. In a few English words the original "n" is retained as in ever and never, ought and nought. The similar prefix "non" from Latin is a combination of "n" and "uno" meaning not one. Thus by devious paths the negating prefixes in English—a, an, un, in, im, non, and n all have the same origin. The English words no and not, the French non, and the German nein (n+ein—not one) have a similar derivation.

The suffix "itis" (myocarditis, nephritis, and polyneuritis) signifies that there is an inflammation of the organ designated. For example, myocarditis is an inflammation of the myocardium (muscle of the heart). The four letters "itis" were originally the Greek adjectival termination for agreement with a feminine noun. The adjective was made to agree with the feminine noun τόσος meaning disease. Sometime in the past writers began to drop the word "disease" and have it understood. Still later by common consent the understood noun became inflammation rather than disease. Thus what was originally a Greek adjective with one meaning has become an English noun with another meaning.

The suffix "ectomy" (thymectomy) is derived from the Greek meaning excision. Thymectomy means excision or removal of the

thymus. Similar words are appendectomy (of appendix), thyroidectomy (of thyroid), and pneumonectomy (of lung). The Greek word is in turn made from two words, εκ—out, and τεμνειν—to cut. The first part appears in such words as ecstascy—state of being beside (or outside) one's self. Through the Latin and old French we have the transitive verb with much the same meaning "to excise"—to cut out or off (ex—out or off, and cidere—to cut).

The suffix "emia" (leukemia and anemia) means blood. It and the related suffixes and prefixes—aemia, hemia, and haemia are all derived from the Greek word, αἷμα, for blood. As a suffix it is seen in leukemia—white blood, and anemia—literally no blood, actually by usage a decreased number of red cells in the blood. As a prefix, the forms with "h" are used, such as hemoglobin—the red coloring matter in the blood. In general American medical terminology today does not use the diphthong "ae." Hence, hemoglobin, not haemoglobin.

ACHYLIA GASTRICA ah-kí-le-ah gaś-trica (a—negative+χυλός—chyle, γαστήρ-stomach)

A condition in which the secretion of the stomach is diminished or absent.

ANESTHESIA an-es-théz e-ah (a—negative+ἀιαθησις sensation)

Loss of feeling or sensation, especially loss of the sense of touch, though the term is used for loss of any or all of the senses. For example, when a person cannot feel anything with the fingers, he or she is said to have anesthesia of the fingers. Also used to designate the state after inhalation of ether or other substance during surgical operations.

The word was coined by Oliver Wendell Holmes on request of the physicians of Boston who early used ether anesthesia.

ANGINA PECTORIS ań-jin-ah peć-toris (ἀγλόυη—a throttling+L. pectus—the breast)

A disease marked by recurring attacks of pain in the chest with a sense of suffocation and at times fainting. The cause is generally accepted to be a decreased supply of blood to the heart muscle. It is thus "the cry of the heart for more blood."

ASCORBIC ACID ah-skór-bik aś-id (a—negative+L. scorbutus—scurvy)

A substance present in the juice of limes and lemons and in various vegetables and berries which prevents scurvy. It is vitamin C.

The discovery of the activity of certain juices in the prevention of scurvy is attributed to the explorer, Captain James Cook, who fed

his sailors sauerkraut juice. British sailors are known as "limies" because for years they were given a daily ration of lime juice to prevent scurvy.

BERIBERI ber-e-ber-e (from Singhalese, "I cannot," signifying that the person is too ill to do anything)

An endemic disease prevalent chiefly in Japan, India, China, and the Philippines and usually fatal. It is marked by spasmodic rigidity of the lower limbs, with muscular atrophy, paralysis, anemia, and neuralgic pains. The disease is believed to be due to a too exclusive diet of overmilled or highly polished rice or other carbohydrate food which is deficient in the accessory food factor known as the anti-neuritic vitamin, Vitamin B_1 or thiamin.

CEREBRAL EMBOLISM sef-e-bral em-bol-izm (L. cerebrum—brain+ ἐυβάλλειν—to throw or put in)

The plugging of a cerebral artery by a clot or obstruction which has been brought to the place by the blood.

EMACIATED e-má-se-a-ted (L. emaciare—to become lean)

Excessive leanness; a wasted condition of the body, usually caused by starvation.

HALLUCINATION hal-u-sin-áshun (L. alucinatio—a wandering of mind, dreaminess)

A sense perception not founded on an objective reality. For example, a person may insist that he sees, hears, or feels something that no one else can see, hear, or feel. He is said to have hallucinations.

HORMONE hor-mon (ὀρμάνειν—to excite or arouse)

A chemical substance produced by one organ, which, when carried to another organ by the blood, excites in the latter organ some change. For example, the thyroid makes a hormone called thyroxin which acts on other tissues to maintain activity at the normal rate. Thus the person who has an insufficient output of the hormone thyroxin is slow and dull, and the person who has too much is overactive and nervous, designated respectively hypothyroidism and hyperthyroidism.

LEUKEMIA lu-ké-me-ah (λευκός—white+αἷμα—blood)

A fatal disease with a marked increase in the number of white blood cells in the blood, together with enlargement of the spleen, lymph nodes, and bone marrow. The disease is marked by progressive anemia, internal hemorrhage, and increasing exhaustion.

MACROCYTIC ANEMIA mak-ro-sí-tic an-é-me-ah (μακρός—large+ κύτος—cell, a—negative+αἷμα—blood)

Anemia characterized by an increase in the average size of red corpuscles.

MALIGNANT mal-ig-nant (L. malignans—acting maliciously)

Severe, and tending to go from bad to worse. For example, malignant small pox. Also used to designate tumors which are cancers in contrast with those which are not (benign tumors); a cancer of the breast is a malignant tumor.

METHYLCHOLANTHRENE methyl-chol-án-threne

An adaptation of the chemical name 6-methyl 5, 10-dimethylene 1, 2-benzanthracene. This formidable name means only this—to a molecule of anthracene (ἄνθραε—coal) there has been added one benzene nucleus in positions 1 and 2, one methyl group in position 6, and two methylene groups in positions 5 and 10. The numbered positions are numbers arbitrarily assigned to each carbon atom in the formula.

When a one per cent solution of it in benzene is painted on the skin of a mouse, cancer follows in from 30 to 150 days. The word itself is a combination of "methyl" which stands for a chemical group containing one carbon atom and three hydrogen atoms (CH_3), "chol" indicating a relation to cholesterol (literally the sterol present in chol or bile), and "anthrene" (a contraction of anthracene.)

MYOCARDITIS mio-kar-dí-tis (μῦς—muscle+καροια—heart+ιτις—inflammation)

Inflammation of the muscular walls of the heart.

NEPHRITIS nef-rí-tis (γεφρος—kidney+ιτις—inflammation)

Inflammation of the kidney.

NIACIN ní-a-cin (L. nicotania—tobacco)

A contracted form of the chemical name nicotinic acid, one of the members of the Vitamin B complex.

POLYNEURITIS pol-e-nu-rí-tis (πολύς—many+γεῦρου—nerve)

Inflammation of many nerves at once.

RETICULOGEN re-tík-u-logen (L. reticulo—a little net+νευναν—to produce)

A highly purified extract of liver with added thiamin used in the treatment of pernicious anemia and related diseases.

RIBOFLAVIN ri-bo-flá-vin (L. ribos—sugar with 5 carbon atoms flavin—yellow)

$C_{17}H_{20}N_4O_6$. Vitamin B_2 or Vitamin G, the heat stable factor of the Vitamin B complex. The average human being requires from 2 to 3 mg. per day.

RITES DE PASSAGE reet duh pa—saj (F. rites—ceremonies, de—of, and passage–transition)

Literally ceremonies or rites of transition. Here, ceremonial observa-

tions, performed according to time-honored ritual, of a young man's arrival at maturity.

SEMICOMATOSE sem-e-kó-mat-os (L. semi—half+κοιμᾶν—to put to sleep)

Relating to a condition of partial loss of consciousness from which the person may be aroused.

THIAMIN thí-am-in (thi-sulfur+amine-ammonia)

The chemical name for crystalline Vitamin B_1.

THYMECTOMY thi-mék-to-me (θυμος—thymus+ἐκτομή—excision)

Removal of the thymus.

GREEK ALPHABET

Greek Letter			Name	English Equivalent
Α	α		Alpha	a
Β	β	ϐ	Beta	b
Γ	γ		Gamma	g (hard)
Δ	δ		Delta	d
Ε	ε		Epsilon	e (short)
Ζ	ζ		Zeta	z
Η	η		Eta	e (long)
Θ	ϑ	θ	Theta	th
Ι	ι		Iota	i
Κ	κ		Kappa	k
Λ	λ		Lambda	l
Μ	μ		Mu	m
Ν	ν		Nu	n
Ξ	ξ		Xi	x
Ο	ο		Omicron	o (short)
Π	π		Pi	p
Ρ	ρ		Rho	r
Σ	σ	ς	Sigma	s
Τ	τ		Tau	t
Υ	υ		Upsilon	u or y
Φ	φ		Phi	ph
Χ	χ		Chi	ch (hard)
Ψ	ψ		Psi	ps
Ω	ω		Omega	o (long)